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An updated checklist of the Thomisidae (Araneae) of Turkey with zoogeographical remarks

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Abstract

This updated checklist of Thomisidae of Turkey is based on published and unpublished records available to the author. At present, 79 species belonging to 14 genera of family Thomisidae have been identified in Turkey.

Keywords: Araneae, Thomisidae, Turkey.

Introduction

Arachnological studies of Turkey began towards the end of the 19th century. They were increased during the 20th century, specially faunistic and taxonomic works. Recently, they continued with an increased speed. In the fauna of Turkey, Thomisidae must be regarded as an insufficiently studied family. The most important papers dealing with the thomisid fauna of the country are those of Kulczyński (1903), Nosek (1905), Roewer (1959), and Simon (1875, 1879, 1884, 1914). Early studies on this family were carried out by Karol (1966a, 1966b, 1966c, 1966d, 1968), who described four new *Xysticus* species from Turkey. However, *X. sislii* Karol, 1966, *X. turcicus* Karol, 1966 and *X. pelini* Karol, 1968 are now synonyms of *X. thessalicus* Simon, 1916 (Wunderlich, 1995), and *X. jezequeli* Karol, 1966 is a synonym of *X. gymnocephalus* Strand, 1915 (Assi, 1986). The previous works were densely concentrated on central Anatolian region, Black Sea region, and the Mediterranean region, i.e. central parts of Turkey.

Turkey has significant ecological properties. It may be the origin country of many spider taxa and it may also be a refugium (an area where conditions have enabled a species or a community of species to survive after extinction in surrounding areas) for living creatures affected by geological and climatic changes more than many countries in the World.

A list of 44 species belonging to 10 genera of family Thomisidae from Turkey was firstly published by Karol (1967). Afterwards, both Turkish and foreign researches made important contributions to the Turkish thomisid fauna. They recorded 55 species belonging to 12 genera from Turkey (Bayram, 2002). According to the checklist of Topçu *et al.* (2005), the Turkish thomisid fauna comprises 56 valid species belonging to 10 genera, most of which were known from a single or just a few localities.

The present checklist is based on all available published and some unpublished records of the distribution of thomisid spiders in Turkey. A total of 79 species from family Thomisidae are recorded in this country. The principal paper is that of Topçu *et al.* (2005), which was based on 41 publications. Now, 21 species are added from recently published 14 papers (i.e. Marusik *et al.*, 2005; Topçu *et al.*, 2006; Logunov, 2006; Logunov & Demir, 2006; Özdemir *et al.*, 2006; Varol *et al.*, 2006; Demir *et al.*, 2006, 2007a, 2007b, 2008, 2008a, 2008b, In press; Bayram *et al.*, 2007).

Material and Methods

The present checklist of the thomisid species of Turkey is mainly based on the data included in “A Checklist of the spiders of Turkey” (Topçu *et al.*, 2005). It is compiled using published records and original data. World distribution of all species follows Platnick (2008). Distribution of species in geographical regions of Turkey is summarized in remarks according to Topçu *et al.* (2005) [MR = Marmara, AR = Aegean, CAR = Central Anatolia, BSR = Black Sea Region, EAR = East Anatolia, SAR = Southeastern Anatolia Region and MER = Mediterranean Regions]. The present zoogeographical characterization is based on the chorotype classification of Anatolian fauna, recently proposed by Vigna Taglianti *et al.* (2000). In this study, as possible as one chorotype description can be identified for each taxon. But this kind of description can not be possible for some taxa, so one or two chorotypes are used for them. The species which are recorded from only one locality in Turkey are characterised by an asterisk (*).

Taxonomy

Family Thomisidae Sundevall, 1833

Genus *Coriarachne* Thorell, 1870

Coriarachne depressa (C.L. Koch, 1837)

Records in Turkey: Aegean and Mediterranean region in Turkey (Bayram, 2002).

Distribution in Turkey: AR and MER. **Chorotype:** Palearctic.

World Distribution: Palearctic.

Genus *Cozyptila* Lehtinen & Marusik, 2005

Cozyptila blackwalli (Simon, 1875)

Records in Turkey: Ankara (Logunov & Demir, 2006).

Distribution in Turkey: CAR *. **Chorotype:** Palearctic.

World Distribution: Palearctic.

Cozyptila guseinovorum Marusik & Kovblyuk, 2005

Records in Turkey: Sakarya, İzmir (Marusik *et al.*, 2005).

Distribution in Turkey: MR and AR. **Chorotype:** Central Asiatic + East European.

World Distribution: Central Asia, Russia, Turkey.

Cozyptila thaleri Marusik & Kovblyuk, 2005

Records in Turkey: Sakarya, Bolu, Konya, Ankara (Logunov & Demir, 2006).

Distribution in Turkey: MR and CAR. **Chorotype:** Eastern European.

World Distribution: Turkey, Ukraine.

Genus *Diaea* Thorell, 1869

Diaea livens Simon, 1876

Records in Turkey: Bursa (Bayram *et al.*, 2002); Gaziantep (Özdemir *et al.*, 2006).

Distribution in Turkey: MR, MER and SAR. **Chorotype:** Holarctic.

World Distribution: USA, Central Europe to Azerbaijan.

Genus *Ebrechtella* Dahl, 1907

Ebrechtella tricuspidata (Fabricius, 1775)

Records in Turkey: Çankırı, Ankara, Yozgat (Demir *et al.*, 2007a).

Distribution in Turkey: CAR *. **Chorotype:** Palearctic.

World Distribution: Palearctic.

Genus *Heriaeus* Simon, 1875

Heriaeus buffoni (Audouin, 1825)

Records in Turkey: İstanbul (Kulczyński, 1903).

Distribution in Turkey: MR *. **Chorotype:** North African + South West Asiatic.

World Distribution: North Africa, Israel.

Heriaeus graminicola (Doleschall, 1852)

Records in Turkey: Niğde, Mersin (Topçu *et al.*, 2006).

Distribution in Turkey: MER *. **Chorotype:** European + Central Asiatic.

World Distribution: Europe to Central Asia.

Heriaeus hirtus (Latreille, 1819)

Records in Turkey: İstanbul (Simon, 1875; Pavesi, 1876).

Distribution in Turkey: MR *. **Chorotype:** European.

World Distribution: Europe to Georgia.

Heriaeus melloteei Simon, 1886

Records in Turkey: Niğde, Mersin, Adana (Topçu *et al.*, 2006); İstanbul (Kulczyński, 1903).

Distribution in Turkey: MR, CAR and MER. **Chorotype:** Palearctic.

World Distribution: Palearctic.

Heriaeus orientalis Simon, 1918

Records in Turkey: İstanbul (Kulczyński, 1903).

Distribution in Turkey: MR *. **Chorotype:** Balkano – Anatolian.

World Distribution: Greece, Turkey, Ukraine.

Heriaeus pilosus Nosek, 1905

Records in Turkey: Sivas, Nevşehir, Kayseri (Nosek, 1905); Erzurum, Tokat (Loerbroks, 1983); Turkey (Reimoser, 1919).

Distribution in Turkey: CAR, EAR and BSR. **Chorotype:** Anatolian endemic.

World Distribution: Turkey.

Heriaeus setiger (O.P.-Cambridge, 1872)

Records in Turkey: Muğla (Dalmas, 1920).

Distribution in Turkey: AR *. **Chorotype:** Palearctic.

World Distribution: Palearctic.

Heriaeus simoni Kulczyński, 1903

Records in Turkey: Hatay, İstanbul (Kulczyński, 1903); İzmir, Bursa, Aydın (Loerbroks, 1983); Turkey (Reimoser, 1919).

Distribution in Turkey: MR and MER. **Chorotype:** Palearctic.

World Distribution: Palearctic.

Heriaeus spinipalpus Loerbroks, 1983

Records in Turkey: Adana, Bitlis, Erzurum, Van (Loerbroks, 1983).

Distribution in Turkey: MER and EAR. **Chorotype:** Mediterranean.

World Distribution: Eastern Mediterranean.

Genus *Misumena* Latreille, 1804

Misumena vatia (Clerck, 1757)

Records in Turkey: İstanbul (Simon, 1875; Pavesi, 1876); Sakarya (Nosek, 1905); Turkey (Reimoser, 1919); Niğde, Mersin (Topçu *et al.*, 2006).

Distribution in Turkey: MER, CAR and MR. **Chorotype:** Holarctic.

World Distribution: Holarctic.

Genus *Monaeses* Thorell, 1869

Monaeses israeliensis Levy, 1973

Records in Turkey: Antalya (Bayram *et al.*, 2007).

Distribution in Turkey: MER *. **Chorotype:** West Asiatic + Central Asiatic.

World Distribution: Greece, Turkey, Israel, Lebanon, Central Asia.

Genus *Ozyptila* Simon, 1864

Ozyptila ankarensis Karol, 1966

Records in Turkey: Ankara (Karol, 1966c).

Distribution in Turkey: CAR *. **Chorotype:** Anatolian endemic.

World Distribution: Turkey.

Ozyptila atomaria (Panzer, 1801)

Records in Turkey: Van (Bayram, 1996a, b), Kırıkkale (Bayram *et al.*, 2005).

Distribution in Turkey: EAR and SAR. **Chorotype:** Palearctic.

World Distribution: Palearctic.

Ozyptila claveata (Walckenaer, 1837)

Records in Turkey: İzmir (Lehtinen, 2002); Gaziantep (Özdemir *et al.*, 2006; Varol *et al.*, 2006); Niğde (Topçu *et al.*, 2006).

Distribution in Turkey: AR and SAR. **Chorotype:** Palearctic.

World Distribution: Palearctic.

Ozyptila clavidorsa Roewer, 1959

Records in Turkey: Gaziantep (Roewer, 1959).

Distribution in Turkey: SAR *. **Chorotype:** Anatolian endemic.

World Distribution: Turkey.

Ozyptila conostyla Hippa, Koponen & Oksala, 1986

Records in Turkey: Yozgat (Hippa *et al.*, 1986).

Distribution in Turkey: CAR *. **Chorotype:** Caucasian.

World Distribution: Turkey to Turkmenistan.

Ozyptila praticola (C.L. Koch, 1837)

Records in Turkey: İstanbul (Roewer, 1959); Van (Bayram, 1996a; Bayram & Varol, 1996); Denizli (Bayram *et al.*, 1998); Kırıkkale (Bayram *et al.*, 2005); Adana (Topçu *et al.*, 2006).

Distribution in Turkey: MR, EAR, AR, CAR and MER. **Chorotype:** Holarctic.

World Distribution: Holarctic.

Ozyptila rauda Simon, 1875

Records in Turkey: Zonguldak (Roewer, 1959).

Distribution in Turkey: BSR (WBR) *. **Chorotype:** Palearctic.

World Distribution: Palearctic.

Ozyptila sanctuaria (O.P.-Cambridge, 1871)

Records in Turkey: Van (Bayram, 1996a); Kırıkkale (Bayram *et al.*, 2005).

Distribution in Turkey: EAR and CAR. **Chorotype:** European.

World Distribution: Europe.

Ozyptila simplex (O.P.-Cambridge, 1862)

Records in Turkey: Turkey (Caporiacco, 1935); Gaziantep (Özdemir *et al.*, 2006); Adana (Topçu *et al.*, 2006).

Distribution in Turkey: EAR and MER. **Chorotype:** Palearctic.

World Distribution: Palearctic.

Ozyptila spirembola Wunderlich, 1995

Records in Turkey: Bolu (Wunderlich, 1995).

Distribution in Turkey: MR *. **Chorotype:** Anatolian endemic.

World Distribution: Turkey.

Ozyptila tricoloripes Strand, 1913

Records in Turkey: Kahramanmaraş, Hatay, (Demir *et al.*, 2008a).

Distribution in Turkey: MER *. **Chorotype:** Turanian.

World Distribution: Israel, Azerbaijan, Turkmenistan.

Genus *Pistius* Simon, 1875

Pistius truncatus (Pallas, 1772)

Records in Turkey: Niğde, Mersin (Topçu *et al.*, 2006); İstanbul (Simon, 1879); Turkey (Karol, 1967).

Distribution in Turkey: CAR, MER and MR. **Chorotype:** Palearctic.

World Distribution: Palearctic.

Genus *Runcinia* Simon, 1875

Runcinia grammica (C.L. Koch, 1837)

Records in Turkey: Sakarya (Nosek, 1905); Mersin, Adana (Topçu *et al.*, 2006); Balıkesir (Karol, 1966d); İstanbul, Hatay (Kulczyński, 1903); Turkey (Karol, 1967; Caporiacco, 1935); Bursa (Kaya & Uğurtaş, 2007).

Distribution in Turkey: MR, MER and AR. **Chorotype:** Palearctic + Ethiopian.

World Distribution: Palearctic, St. Helena, South Africa.

Genus *Synema* Simon, 1864

Synema globosum (Fabricius, 1775)

Records in Turkey: Kocaeli, Sakarya (Nosek, 1905); Hatay, Kilis, Adana, Osmaniye (Demir *et al.*, 2007b); Gaziantep (Özdemir *et al.*, 2006); Niğde, Mersin, Adana (Topçu *et al.*, 2006); Bursa (Karol, 1966d); İstanbul (Simon, 1875; Pavesi, 1876); Hatay, İstanbul (Kulczyński, 1903); Turkey (Strand, 1917; Caporiacco, 1935); Aydın (Giltay, 1932); Osmaniye (Roewer, 1959); Bursa (Kaya & Uğurtaş, 2007).

Distribution in Turkey: MR, MER, SAR, AR and CAR. **Chorotype:** Palearctic.

World Distribution: Palearctic.

Synema plorator (O.P.-Cambridge, 1872)

Records in Turkey: Osmaniye, Kahramanmaraş (Demir *et al.*, 2007b); Bursa (Karol, 1966d).

Distribution in Turkey: MER and MR. **Chorotype:** South West Asiatic + Central Asiatic.

World Distribution: Slovakia to Israel, Central Asia.

Synema utotchkini Marusik & Logunov, 1995

Records in Turkey: Kahramanmaraş (Demir *et al.*, 2007b).

Distribution in Turkey: MER *. **Chorotype:** Caucasian.

World Distribution: Kazakhstan, Kyrgyzstan, Turkey.

Genus *Thomisus* Walckenaer, 1805

Thomisus citrinellus Simon, 1875

Records in Turkey: Black Sea Region (Topçu *et al.*, 2005).

Distribution in Turkey: BSR (MBR) *. **Chorotype:** Afrotropico - Mediterranean.

World Distribution: Mediterranean, Africa, Yemen, Socotra, Seychelles.

Thomisus onustus Walckenaer, 1805

Records in Turkey: Van (Bayram, 1996b; Bayram & Varol, 1996); Denizli (Bayram *et al.*, 1998); Manisa, İzmir, Aydın (Bayram *et al.*, 2000); Sakarya, Sivas, Konya, Kayseri (Nosek, 1905); Kırıkkale (Bayram *et al.*, 2005); Gaziantep (Özdemir *et al.*, 2006); Niğde, Mersin, Adana (Topçu *et al.*, 2006); Ankara (Karol, 1966d); Turkey (Caporiacco, 1935; Ono & Martens, 2005); İstanbul (Simon, 1875; Pavesi, 1876; Kulczyński, 1903; Giltay, 1932); İzmir (Kulczyński, 1903); Hatay, Gaziantep (Roewer, 1959); Bursa (Kaya & Uğurtaş, 2007).

Distribution in Turkey: EAR, AR, MR, SAR, MER and CAR. **Chorotype:** Palearctic.

World Distribution: Palearctic.

Thomisus zyuzini Marusik & Logunov, 1990

Records in Turkey: Osmaniye (Demir *et al.*, 2008a).

Distribution in Turkey: MER *. **Chorotype:** South West Asiatic + Central Asiatic.

World Distribution: Saudi Arabia to Central Asia.

Genus *Tmarus* Simon, 1875

Tmarus piochardi (Simon, 1866)

Records in Turkey: Diyarbakır, Muğla (Bayram *et al.*, 2007).

Distribution in Turkey: SAR and MER. **Chorotype:** Mediterranean.

World Distribution: Mediterranean.

Tmarus stellio Simon, 1875

Records in Turkey: Ankara (Demir *et al.*, 2007a).

Distribution in Turkey: CAR *. **Chorotype:** Palearctic.

World Distribution: Palearctic.

Genus *Xysticus* C.L. Koch, 1835

Xysticus abditus Logunov, 2006

Records in Turkey: Niğde (Logunov, 2006).

Distribution in Turkey: CAR *. **Chorotype:** Balkano – Anatolian.

World Distribution: Bulgaria, Turkey.

Xysticus acerbus Thorell, 1872

Records in Turkey: Turkey (Simon, 1914); İstanbul (Simon, 1875; Pavesi, 1876); Gaziantep (Roewer, 1959).

Distribution in Turkey: MR and SAR. **Chorotype:** European + Central Asiatic.

World Distribution: Europe to Central Asia.

Xysticus anatolicus Demir, Aktaş & Topçu, 2008

Records in Turkey: Kayseri (Demir *et al.*, 2008b).

Distribution in Turkey: CAR *. **Chorotype:** Anatolian endemic.

World Distribution: Turkey.

Xysticus audax (Schränk, 1803)

Records in Turkey: İstanbul, Adana, Osmaniye, Hatay (Roewer, 1959); Turkey (Simon, 1914).

Distribution in Turkey: MR and MER. **Chorotype:** Palearctic.

World Distribution: Palearctic.

Xysticus bacurianensis Mcheidze, 1971

Records in Turkey: Trabzon (Logunov & Demir, 2006).

Distribution in Turkey: BSR *. **Chorotype:** Turanian + East European.

World Distribution: Turkey, Russia, Georgia, Azerbaijan.

Xysticus bifasciatus C.L. Koch, 1837

Records in Turkey: Konya (Bayram & Allahverdi, 1994, 1999); Manisa, İzmir, Aydın (Bayram *et al.*, 2000); Kırıkkale (Bayram *et al.*, 2005); Niğde (Topçu & Demir, 2004; Topçu *et al.*, 2006).

Distribution in Turkey: CAR and AR. **Chorotype:** Palearctic.

World Distribution: Palearctic.

Xysticus bufo (Dufour, 1820)

Records in Turkey: İstanbul (Simon, 1875; Pavesi, 1876); İzmir (Pavesi, 1876).

Distribution in Turkey: MR and AR. **Chorotype:** Mediterranean.

World Distribution: Mediterranean.

Xysticus caperatus Simon, 1875

Records in Turkey: Osmaniye (Demir, *et al.*, In press).

Distribution in Turkey: MER *. **Chorotype:** Mediterranean + East European.

World Distribution: Mediterranean, Russia.

Xysticus cribratus Simon, 1885

Records in Turkey: Turkey (Lehtinen, 2002); Ankara (Karol, 1966d).

Distribution in Turkey: CAR *. **Chorotype:** Mediterranean + Asiatic.

World Distribution: Mediterranean to China, Sudan.

Xysticus cristatus (Clerck, 1757)

Records in Turkey: Van (Bayram, 1994, 1996b, c; Bayram *et al.*, 1999; Bayram & Varol, 1999); Manisa, İzmir, Aydın (Bayram *et al.*, 2000); Denizli (Bayram *et al.*, 1998); Konya (Bayram & Allahverdi, 1999); Kırıkkale (Bayram *et al.*, 2005); Niğde, Mersin (Topçu *et al.*, 2006); Trabzon (Logunov & Demir, 2006).

Distribution in Turkey: EAR, SAR, AR, CAR, MER and BSR. **Chorotype:** Palearctic.

World Distribution: Palearctic.

Xysticus demirsoyi Demir, Topçu & Türkes, 2006

Records in Turkey: Niğde (Demir, *et al.*, 2006).

Distribution in Turkey: CAR *. **Chorotype:** Anatolian endemic.

World Distribution: Turkey.

Xysticus edax (O. P.-Cambridge, 1872)

Records in Turkey: Osmaniye, Kilis, Kahramanmaraş, Hatay (Demir, *et al.*, In press).

Distribution in Turkey: MER *. **Chorotype:** South West Asiatic.

World Distribution: Israel.

Xysticus erraticus (Blackwall, 1834)

Records in Turkey: Van (Bayram, 1996a).

Distribution in Turkey: EAR *. **Chorotype:** West Palearctic.

World Distribution: Europe, Russia.

Xysticus ferrugineus Menge, 1876

Records in Turkey: Niğde (Topçu & Demir, 2004; Topçu *et al.*, 2006).

Distribution in Turkey: CAR *. **Chorotype:** Palearctic.

World Distribution: Palearctic.

Xysticus ferus O.P.-Cambridge, 1876

Records in Turkey: Muğla (Dalmas, 1920).

Distribution in Turkey: MER *. **Chorotype:** East Mediterranean.

World Distribution: Cyprus, Egypt, Israel.

Xysticus gallicus Simon, 1875

Records in Turkey: Turkey (Simon, 1914, Karol, 1967; Ono & Martens, 2005); Kayseri (Nosek, 1905).

Distribution in Turkey: CAR *. **Chorotype:** Palearctic.

World Distribution: Palearctic.

Xysticus graecus C.L. Koch, 1837

Records in Turkey: Ankara (Karol, 1966d), Bursa, İstanbul (Kulczyński, 1903).

Distribution in Turkey: CAR and MR. **Chorotype:** East Mediterranean + East European.

World Distribution: Eastern Mediterranean, Russia.

Xysticus gymnocephalus Strand, 1915

Records in Turkey: Ankara (Karol, 1966a, 1966d).

Distribution in Turkey: CAR *. **Chorotype:** South West Asiatic.

World Distribution: Turkey, Lebanon, Israel.

Xysticus kaznakovi Utochkin, 1968

Records in Turkey: Kahramanmaraş, Osmaniye (Demir, *et al.*, In press).

Distribution in Turkey: MER *. **Chorotype:** Central Asiatic.

World Distribution: Central Asia.

Xysticus kochi Thorell, 1872

Records in Turkey: Sakarya, Kayseri (Nosek, 1905); Turkey (Reimoser, 1919); Konya (Bayram & Allahverdi, 1994, 1999); Denizli (Bayram *et al.*, 1998); Van (Bayram & Varol, 2000); Kırıkkale (Bayram *et al.*, 2005); Niğde, Mersin (Topçu *et al.*, 2006); Ankara, Bursa (Karol, 1966d); İstanbul (Simon, 1875; Pavesi, 1876); Turkey (Caporiacco, 1935); Çankırı, Konya, Yozgat, Isparta, Bolu, Adana, Kayseri, Sinop, Zonguldak, Nevşehir (Logunov & Demir, 2006).

Distribution in Turkey: MR, CAR, AR, SAR, MER and BSR. **Chorotype:** Palearctic.

World Distribution: Europe, Mediterranean to Central Asia.

Xysticus laetus Thorell, 1875

Records in Turkey: Konya (Nosek, 1905); Turkey (Reimoser, 1919); Mersin (Topçu *et al.*, 2006); Nevşehir, Çankırı, Konya, Kırıkkale, Bolu, Yozgat, Niğde, Antalya (Logunov, 2006); Bursa (Kaya & Uğurtaş, 2007).

Distribution in Turkey: CAR, MER and MR. **Chorotype:** East Mediterranean + South West Asiatic.

World Distribution: Italy to Central Asia.

Comment: All records of *Xysticus kempeleni* Thorell, 1872 from Turkey belong to *X. laetus* (Logunov, 2006).

Xysticus lalandei (Audouin, 1825)

Records in Turkey: Ankara (Karol, 1966d); Konya, Niğde, Kayseri (Nosek, 1905); Turkey (Strand, 1917); Muğla (Dalmas, 1920).

Distribution in Turkey: CAR and MER. **Chorotype:** North East African - Sindian.

World Distribution: Egypt, Israel.

Xysticus lanio C.L. Koch, 1835

Records in Turkey: İstanbul (Pavesi, 1876); Hatay (Roewer, 1959); Niğde, Mersin (Topçu *et al.*, 2006).

Distribution in Turkey: MR, MER and SAR. **Chorotype:** Palearctic.

World Distribution: Palearctic.

Xysticus lineatus (Westring, 1851)

Records in Turkey: Mersin (Topçu & Demir, 2004; Topçu *et al.*, 2006).

Distribution in Turkey: MER *. **Chorotype:** Palearctic.

World Distribution: Palearctic.

Xysticus luctator L. Koch, 1870

Records in Turkey: Niğde (Nosek, 1905).

Distribution in Turkey: CAR *. **Chorotype:** Palearctic.

World Distribution: Palearctic.

Xysticus luctuosus (Blackwall, 1836)

Records in Turkey: Van (Bayram & Varol, 1999, 2000; Bayram *et al.*, 1999); Konya (Bayram & Allahverdi, 1994); Gaziantep (Özdemir *et al.*, 2006).

Distribution in Turkey: SAR, CAR and EAR. **Chorotype:** Holarctic.

World Distribution: Holarctic.

Xysticus macedonicus Silhavy, 1944

Records in Turkey: Gaziantep (Özdemir *et al.*, 2006).

Distribution in Turkey: SAR *. **Chorotype:** Central European.

World Distribution: Germany, Switzerland, Austria, Macedonia, Turkey.

Xysticus ninnii fusciventris Crome, 1965

Records in Turkey: Sivas (Nosek, 1905); Turkey (Reimoser, 1919); Van (Bayram *et al.*, 1999; Bayram & Varol, 2000); Mersin (Topçu *et al.*, 2006); Sivas, Çankırı, Kayseri, Konya (Logunov & Demir, 2006).

Distribution in Turkey: SAR, MER and CAR. **Chorotype:** Eastern Europe+Central Asiatic.

World Distribution: Eastern Europe to Mongolia.

Xysticus nubilus Simon, 1875

Records in Turkey: İzmir (Simon, 1914).

Distribution in Turkey: AR *. **Chorotype:** Mediterranean.

World Distribution: Mediterranean, Azores, Macronesia.

Xysticus pseudolanio Wunderlich, 1995

Records in Turkey: Bolu, Artvin (Wunderlich, 1995).

Distribution in Turkey: MR and BSR. **Chorotype:** Anatolian endemic.

World Distribution: Turkey.

Xysticus pseudorectilineus (Wunderlich, 1995)

Records in Turkey: Adana (Wunderlich, 1995); Adana, Niğde, Adana, Nevşehir, Osmaniye, Antalya, Kayseri, Mersin, Şanlıurfa, Gaziantep (Demir *et al.*, 2008).

Distribution in Turkey: MER, CAR and EAR. **Chorotype:** Anatolian endemic.

World Distribution: Turkey.

Xysticus rectilineus (O.P.-Cambridge, 1872)

Records in Turkey: Ankara (Karol, 1966d).

Distribution in Turkey: CAR *. **Chorotype:** South West Asiatic.

World Distribution: Syria, Lebanon, Israel.

Xysticus robustus (Hahn, 1832)

Records in Turkey: Van (Bayram, 1996a; Bayram & Varol, 1996; Bayram *et al.*, 1999); Konya (Bayram & Allahverdi, 1994, 1999); Manisa, İzmir, Aydın (Bayram *et al.*, 2000); Kırıkkale (Bayram *et al.*, 2005); Gaziantep (Özdemir *et al.*, 2006); Niğde, Mersin (Topçu *et al.*, 2006).

Distribution in Turkey: SAR, CAR, AR, EAR and MER. **Chorotype:** European + Central Asiatic.

World Distribution: Europe to Central Asia.

Xysticus sabulosus (Hahn, 1832)

Records in Turkey: Van (Bayram *et al.*, 1999); Niğde, Mersin (Topçu *et al.*, 2006); İstanbul (Simon, 1875; Pavesi, 1876).

Distribution in Turkey: SAR, CAR and MR. **Chorotype:** Palearctic.

World Distribution: Palearctic.

Xysticus striatipes L. Koch, 1870

Records in Turkey: Ankara (Karol, 1966d); Mersin (Topçu *et al.*, 2006); Bursa (Kaya & Uğurtaş, 2007).

Distribution in Turkey: CAR, MER and MR. **Chorotype:** Palearctic.

World Distribution: Palearctic.

Xysticus thessalicoides Wunderlich, 1995

Records in Turkey: Antalya, Kastamonu, Bolu, Trabzon (Logunov & Demir, 2006).

Distribution in Turkey: MER, BSR and MR. **Chorotype:** Balkano – Anatolian.

World Distribution: Greece, Crete, Turkey.

Xysticus thessalicus Simon, 1916

Records in Turkey: Ankara (Karol, 1966d); Konya (Karol, 1966b, 1966d, 1968); Manisa (Azarkina & Logunov, 2000); Konya, Mersin, Yozgat (Logunov & Demir, 2006).

Distribution in Turkey: CAR, AR and MER. **Chorotype:** North East Mediterranean.

World Distribution: Balkans, Greece, Turkey, Israel.

Xysticus tristrami (O.P.-Cambridge, 1872)

Records in Turkey: Konya, Niğde, Kayseri (Nosek, 1905); Hatay (Simon, 1884).

Distribution in Turkey: CAR and MER. **Chorotype:** South West Asiatic + Central Asiatic.

World Distribution: Saudi Arabia to Central Asia.

Xysticus ulmi (Hahn, 1831)

Records in Turkey: Konya (Karol, 1966d); Van (Bayram, 1996c; Bayram *et al.*, 1999); Kırıkkale (Bayram *et al.*, 2005); Gaziantep (Özdemir *et al.*, 2006); Mersin (Topçu *et al.*, 2006).

Distribution in Turkey: CAR, SAR, EAR and MER. **Chorotype:** Palearctic.

World Distribution: Palearctic.

Xysticus viduus Kulczyński, 1898

Records in Turkey: Niğde (Topçu & Demir, 2004; Topçu *et al.*, 2006).

Distribution in Turkey: CAR *. **Chorotype:** Palearctic.

World Distribution: Palearctic.

Xysticus xerodermus Strand, 1913

Records in Turkey: Konya, Yozgat (Logunov & Demir, 2006).

Distribution in Turkey: CAR *. **Chorotype:** South West Asiatic.

World Distribution: Turkey, Israel.

Discussion

Turkey is a bridge between Asia and Europe. Its geographical location is very important in Palearctic region. Turkey consists of two general parts as Trace and Anatolia. The European section of Turkey is eastern Thrace. It forms the borders of Turkey with Greece and Bulgaria. The Asian part of the country, Anatolia, consists of a high central plateau with narrow coastal plains. Turkey has a great variability in topography and climate. The fact that Anatolia is surrounded from three sides by sea, its situation in the temperate climatic zone, its geological and geomorphic structure, and topography are main contributing factors affecting diversity of species in terrestrial

ecosystems. This study has increased the number of thomisid spiders in Turkey to 79 species belonging to 14 genera.

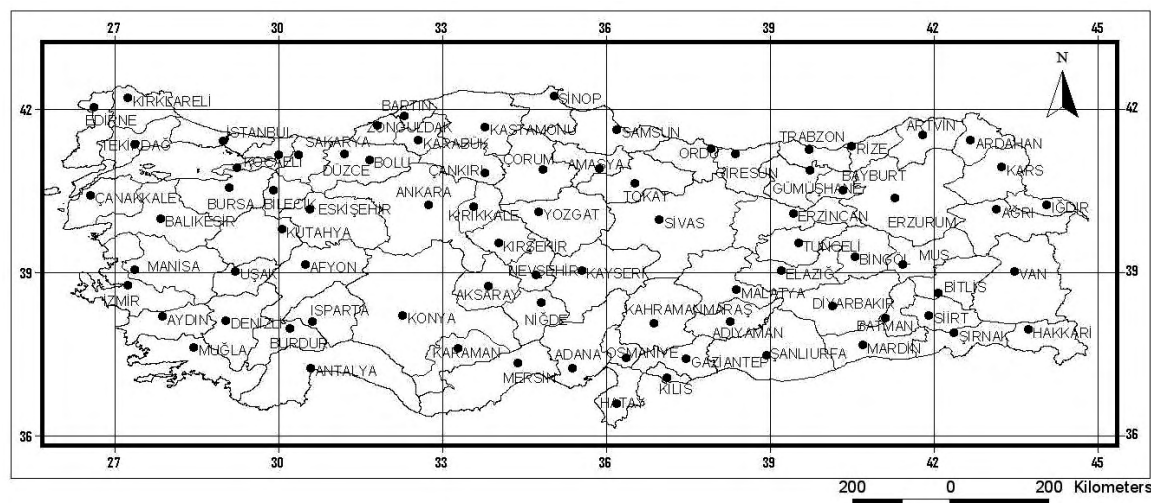


Fig. 1. Provinces of Turkey.

Zoogeographically, *Coriarachne depressa*, *Cozyptila blackwalli*, *Ebrechtella tricuspidata*, *Heriaeus melloteei*, *H. setiger*, *H. simoni*, *Ozyptila atomaria*, *O. claveata*, *O. rauda*, *O. simplex*, *Pistius truncatus*, *Runcinia grammica*, *Synema globosum*, *Thomisus onustus*, *Tmarus stellio*, *Xysticus audax*, *X. bifasciatus*, *X. cristatus*, *X. ferrugineus*, *X. gallicus*, *X. kochi*, *X. lanio*, *X. lineatus*, *X. luctator*, *X. sabulosus*, *X. striatipes*, *X. ulmi* and *X. viduus* have the Palearctic chorotype. *Cozyptila guseinovorum* has the Central Asiatic + East European chorotypes. *Cozyptila thaleri* has the Eastern European chorotype. *Diaea livens*, *Misumena vatia*, *Ozyptila praticola* and *Xysticus luctuosus* have the Holarctic chorotype. *Heriaeus buffoni* has the North African + South West Asiatic chorotypes. *Heriaeus graminicola*, *Xysticus acerbus* and *X. robustus* have the European + Central Asiatic chorotypes. *Heriaeus hirtus* and *Ozyptila sanctuaria* have the European chorotype. *Heriaeus orientalis*, *Xysticus abditus* and *X. thessalicoides* have the Balkano – Anatolian chorotype. *Monaeses israeliensis*, *Synema plorator*, *Thomisus zyuzini* and *Xysticus tristrami* have the South West Asiatic + Central Asiatic chorotypes. *Ozyptila conostyla* and *Synema utotchkini* have the Caucasian chorotype. *Ozyptila tricoloripes* has the Turanian chorotype. *Thomisus citrinellus* has the Afrotropico - Mediterranean chorotype. *Heriaeus spinipalpus*, *Tmarus piochardi*, *Xysticus bufo* and *X. nubilus* have the Mediterranean chorotype. *Xysticus bacurianensis* has the Turanian + East European chorotypes. *Xysticus cribratus* has the Mediterranean + Asiatic chorotypes. *Xysticus edax*, *X. gymnocephalus*, *X. rectilineus* and *X. xerodermus* has the South West Asiatic chorotype. *Xysticus erraticus* has the West Palearctic chorotype. *Xysticus ferus* has the East Mediterranean chorotype. *Xysticus graecus* has the East Mediterranean + East European chorotypes. *Xysticus caperatus* has the Mediterranean + East European chorotypes. *Xysticus kaznakovi* has the Central Asiatic chorotype. *Xysticus laetus* has the East Mediterranean + South West Asiatic chorotypes. *Xysticus lalandei* has the North East African - Sindian chorotype. *Xysticus macedonicus* has the Central European chorotype. *X. ninnii fusciventris* has the Eastern Europe + Central Asiatic chorotypes. *Xysticus thessalicus* has the North East Mediterranean chorotype. *Heriaeus pilosus*, *Ozyptila ankarensis*, *O. clavidorsa*, *O. spirembola*, *Xysticus anaticus*, *X. demirsoyi*, *X. pseudolanio* and *X. pseudorectilineus* have the Anatolian endemic chorotype.

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The first record of genus *Pax* (Araneae: Zodariidae) in Turkey

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Abstract

The spider species *Pax islamita* (Simon, 1873) was found in Turkey for the first time. This represents a new record of both the species and genus *Pax* Levy, 1990 from Turkey. Its description, characteristic features, drawings and photographs of genitalia and general habitus of both sexes are presented.

Keywords: Araneae, Zodariidae, Turkey.

Introduction

Family Zodariidae includes small to large araneomorph spiders with an enormous variation of shapes. They are ecribellate entelegyne spiders. They are diagnosed by having three tarsal claws with teeth on paired tarsal claws implanted on lateral side facing opposing claw, six or eight eyes, very short cheliceral fangs, long anterior lateral spinnerets, reduced posterior spinnerets and by the absence of serrula (Jocqué & Dippenaar-Schoeman, 2006).

Family Zodariidae is a big spider family which includes 868 species in 74 genera with worldwide distribution (Platnick, 2008). Although this family is represented in the eastern Mediterranean region, Turkish zodariids are poorly known. Only 33 species of 3 genera have so far recorded in the country (Topçu *et al.*, 2005).

Genus *Pax* [Type-species. *Habronestes libani* Simon, 1873, from Lebanon] was described by Levy (1990) to include two new species from Israel [*P. engediensis* and *P. palmonii*] in addition to three Levantine species transferred from *Habronestes* [*P. islamita* (Simon, 1873) and *P. libani* (Simon, 1873)] and *Lachesis* [*P. meadi* (O. P.-Cambridge, 1872)]. It is considered a senior synonym of *Storamia* Jocqué, 1991 (Platnick, 2008). *Pax* is very near to genus *Mallinella* Strand, 1906 of tropical Africa and south East Asia.

This work adds *Pax islamita* (Simon, 1873) as a new record of the species and genus to the zodariid spider fauna of Turkey.

Material and Methods

This study is based on specimens collected from southern Turkey and preserved in 70% ethanol. The identification was made by means of a SZX61 Olympus stereomicroscope and according to Levy (1990). Examined specimens are deposited in the Arachnology Museum of Niğde University (NUAM). All measurements are in millimetres.

Results

Pax islamita (Simon, 1873) (Figs. 1-11)

Material examined: TURKEY: **Kayseri province**, Yahyalı district, surrounding of Kapuz başı waterfalls, (37°46'N, 35°23'E), 1270m, under stones, 26.V.2007 (3♂♂, 3♀♀). **Osmaniye Province**, Kadirli district, Karatepe National Park, Çürükler village, (37°15'N, 36°13'E), 297m, under stone and on soil, 24.V.2007 (2♂♂); Hasanbeyli district, (37°09'N, 36°27'E), 661m, under stone, 02.V.2007 (1♂); Toprakkale district, (37°03'N, 36°08'E), 01.V.2007 (1♂, 1♀). **Kilis Province**, Sabuncu village (36°50'N, 36°53'E), 521m, under stone, 02.V.2007 (1♀). **Hatay Province**, Dört Yol district, Karakese village, (36°50'N, 36°16'E), 520m, 13.V.2008 (2♂♂, 2♀♀). **Ankara Province**, Sincan district (39°58'N, 32°35'E), 855m, 21.VIII.2007 (1♂, 1♀).

Description: Measurements. 2♂♂ (Fig. 1): Total length 7.5-8.0. Carapace length 3.8-4.0, width 3.0-3.2. Abdomen length 3.7-4.0, width 2.7-2.9; 2♀♀ (Fig. 2): Total length 9.0-10.5. Carapace length 3.7-4.0, width 2.4-2.8. Abdomen length 5.3-6.5, width 3.2-4.0.

Prosoma rectangular shaped, slightly narrowed in front, slightly elevated in the middle, shiny blackish-brown with no patterns. Male carapace slightly enlarged and darkened than female. Fovea is narrow and distinct. Anterior and posterior eye rows relatively procurved; all eyes are nearly equal and relatively equidistant. Chelicerae have the same colour of carapace; with small fangs. Endites and labium lighter than carapace. Sternum triangular shaped; dark brown with densely covered by black hairs. Legs reddish-yellow; femora dark brown. Abdomen dark, oval shaped with large dorsal scutum in male. Male palp (Figs. 3-5, 8-9) and epigyne (Figs. 6-7, 10-11) resemble description of Levy (1990).

Comment: Adult males and females of *Pax islamita* were collected in May, except those from Sincan district, Ankara Province, in August.

All species of genus *Pax* are known from the Middle East. *P. meadi* (O. P.-Cambridge, 1872) is only known from the type locality, Jericho, Palestine. *P. libani* (Simon, 1873) is recorded from Lebanon and Israel (7 localities, Levy, 1990). Adult males and females were taken in the winter and spring, November to March. *P. palmonii* Levy, 1990 and *P. engediensis* Levy, 1990 are only known from Israel.

P. islamita (Simon, 1873) is recorded from Syria (Damascus), Lebanon (Beirut and near Ba'albek), and Israel (Tiberias, Dan, Mt Carmel, Wadi Natuf in Samaria, En Matta) where an adult male and a female were collected in May and one male was found in August (Levy, 1990). The recording of this species from Turkey widens its distribution to the north and west (Fig. 12).

Acknowledgments

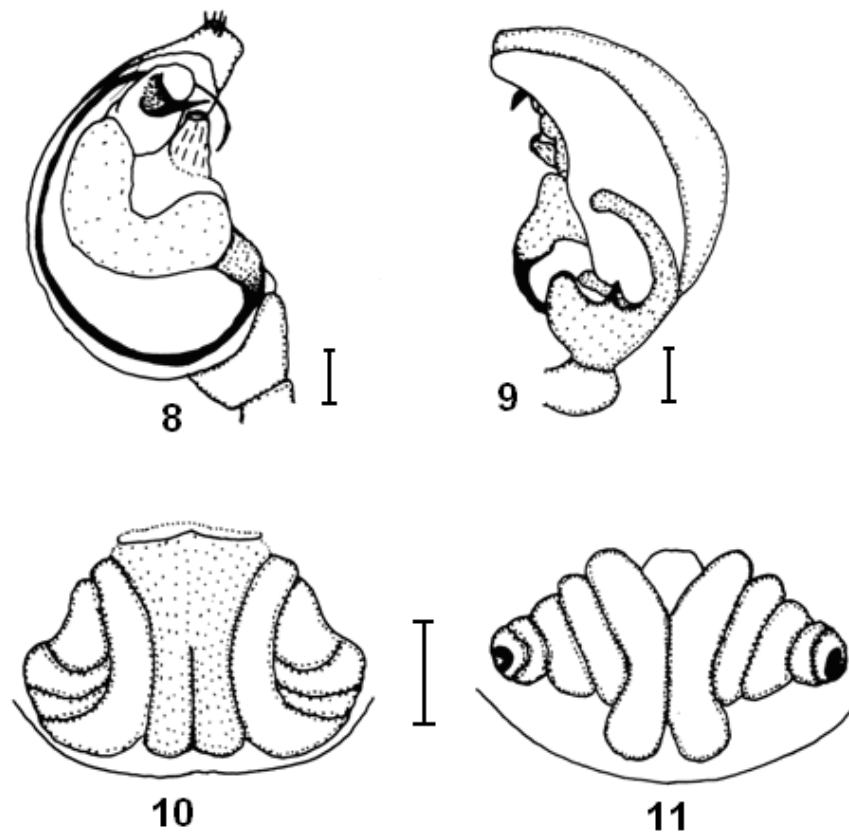
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Figs. 1–7: Photographs of *Pax islamita* (Simon, 1873). 1-2. General habitus. 1. Male. 2. Female. 3-5. Right male palp. 3. Prolateral view. 4. Retrolateral view. 5. Ventral view. 6-7. Female. 6. Epigynum, ventral view. 7. Vulvae, dorsal view.

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Figs. 8–11. Drawings of genitalia of *Pax islamita* (Simon, 1873). 8-9. Left male palp. 8. Ventral view. 9. Retrolateral view. 10-11. Female. 10. Epigynum, ventral view. 11. Vulvae, dorsal view. Scale bars: 0.25 mm.

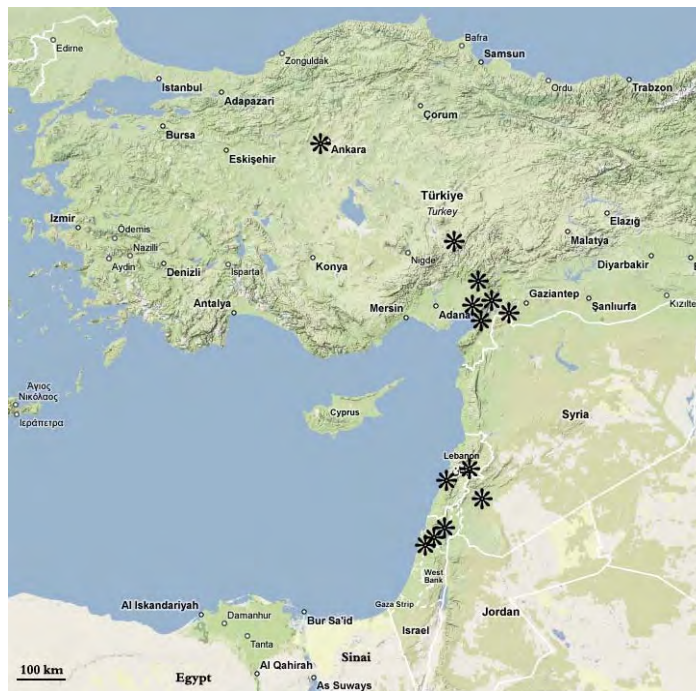


Fig. 12. Distribution map of *Pax islamita* (Simon, 1873) [*] in the eastern Mediterranean region.

Three new records for the spider fauna of Turkey (Araneae: Araneidae, Palpimanidae, Theridiidae)

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Abstract

Aculepeira carbonaria (L. Koch, 1869), *Palpimanus sogdianus* Charitonov, 1946 and *Episinus maculipes* Cavanna, 1876 (Araneidae, Palpimanidae, Theridiidae) are recorded for the first time from Turkey. Their characteristic features and genitalia drawings are presented, together with the geographical distribution of the species.

Keywords: *Aculepeira carbonaria*, *Episinus maculipes*, *Palpimanus sogdianus*, Araneae, New records, Turkey.

Introduction

Turkey, with its different geographic regions, has a peculiar continental fauna rich of species due to its diverse ecosystem types. Although many reports have been made on terrestrial and aquatic animals from Turkey since the late 19th century, detailed studies on some groups are still needed; one of them is the order Araneae (spiders). It currently includes 108 families, 3694 genera, and 40.462 species (Platnick, 2008). Furthermore, 600 fossil species have been described (Selden, 1996; Selden & Dunlop, 1998).

The most comprehensive lists of Turkish spiders are those of Karol (1967) who listed 302 species belonging to 119 genera with several subspecies, and Bayram (2002) who listed 520 species belonging to 162 genera from Turkey. Most recently, Topçu *et al.* (2005) prepared an updated checklist of spiders of Turkey, incorporating data from previous lists. In this study, a total of 613 species and 2 subspecies from Turkey were listed. Thereafter, many authors made contributions in their papers to the spider fauna of Turkey, such as Kaya *et al.* (2006), Seyyar *et al.* (2006a, b), Bayram *et al.* (2007a, b), Demir *et al.* (2007a, b), Kunt *et al.* (2008a, b). Currently, the spider fauna of Turkey consists of 676 species belonging to 226 genera (Bayram *et al.*, 2008).

The aim of the present study is to present new faunistic records for spider fauna of Turkey. In this paper, *Aculepeira carbonaria* (L. Koch, 1869), *Episinus maculipes* Cavanna, 1876 and *Palpimanus sogdianus* Charitonov, 1946 are reported as new records for the araneo-fauna of Turkey.

Material and Methods

All specimens were collected from three different localities of Gaziantep Province in Turkey (Fig. 1). The specimens were collected by means of hand aspirator or sweeping net and preserved in 70% ethanol. Identification was made by means of SMZ10A Nikon stereo microscope using the keys of Heimer & Nentwig (1991), Levi (1977), Marusik & Guseinov (2003). A camera lucida attached to the stereo microscope was used for the genitalia drawings. The specimens were deposited in the museum of the Turkish Arachnological Society (MTAS-TURKEY). All measurements are in millimetres.

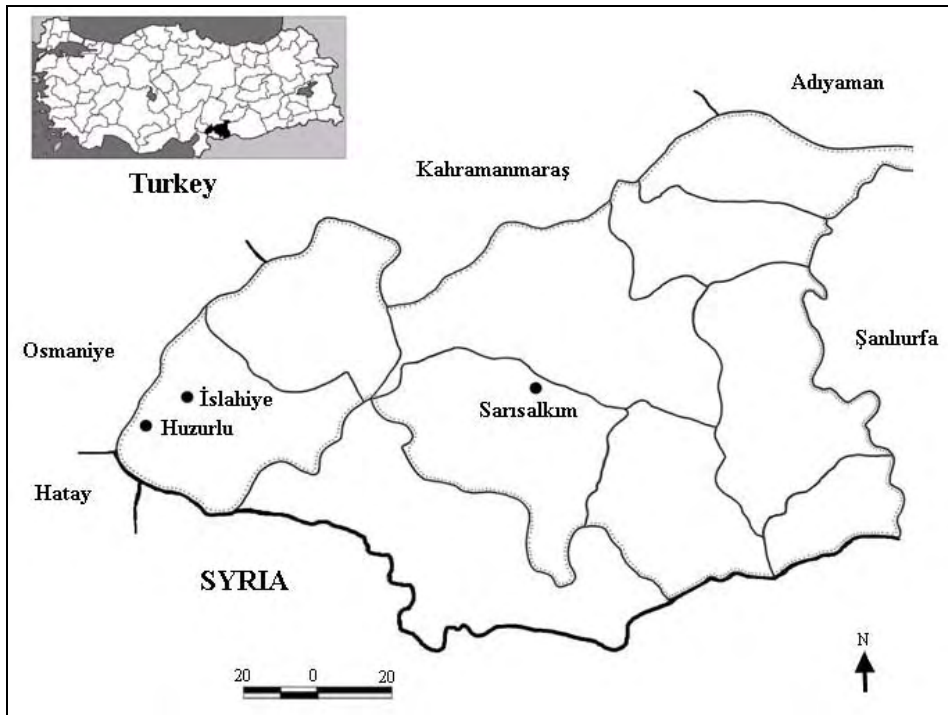


Fig. 1: Map of the study area.

Results and Discussion

I. Family Araneidae Simon, 1895 (Orb web spiders) includes 2979 described species in 166 genera, to be the third largest family, after Salticidae and Linyphiidae (Platnick, 2008). The araneid spiders are usually big and have relatively short and strong spined legs. The height of clypeus is less than two diameters of anterior median eyes. The chelicerae are always without lateral stridulation grooves and mostly with lateral condyle. The proximal paracymbium of the male palp is relatively small and glossy (Heimer & Nentwig 1991).

Genus *Aculepeira* Chamberlin & Ivie, 1942 has a median, ventral white streak on the dorsum but differs in both sexes by the elongate, egg-shaped abdomen; the female has a large sclerotized epigynum with a large scape; the male has a large palpus with long, prominent, median apophysis with two flagella and a large boat-shaped to disk-shaped conductor. *Aculepeira* differs from the related *Araneus* by having an elongate, egg-shaped abdomen that is widest anteriorly; the abdomen of the large *Araneus* usually ranges in shape from spherical to longer than wide and may have humps. Unlike any of the large *Araneus* species, *Aculepeira* species have a median, ventral white mark on the dorsum of abdomen (Levi, 1977).

Aculepeira carbonaria (L. Koch, 1869) (Fig. 2)

Material examined: 3♀♀ (MTAS/Ara: 0609-11), Sarisalkım Village, (37°05'32.64"N; 37°16'42.06"E, Gaziantep Province), 02.V.2006, collected from the tops of dry annual plants by a sweeping net.

Description: Body length (n=3): 8.08 (7.57-8.65). General appearance is darkish. Prosoma is greyish black, its sides are dark blackish brown with light border. Legs are greyish black with yellowish brown rings and blackish bristles. Legs measurements are given in Table (1). Opisthosoma is blackish, covered by patches of yellowish white spots, also covered with numerous setae. In addition, a yellowish brown pine tree like shape exists on the opisthosoma.

World Distribution: Palaearctic (Platnick, 2008).

Table 1: Legs measurements of *Aculepeira carbonaria* from Turkey.

Leg (n=3)	Femur	Patella + Tibia	Metatarsus	Tarsus	Total
I	4.21	5.17	3.31	1.43	14.12
II	4.02	4.85	3.06	1.14	13.07
III	2.58	2.87	1.82	0.90	8.07
IV	3.93	4.02	2.78	0.95	11.68

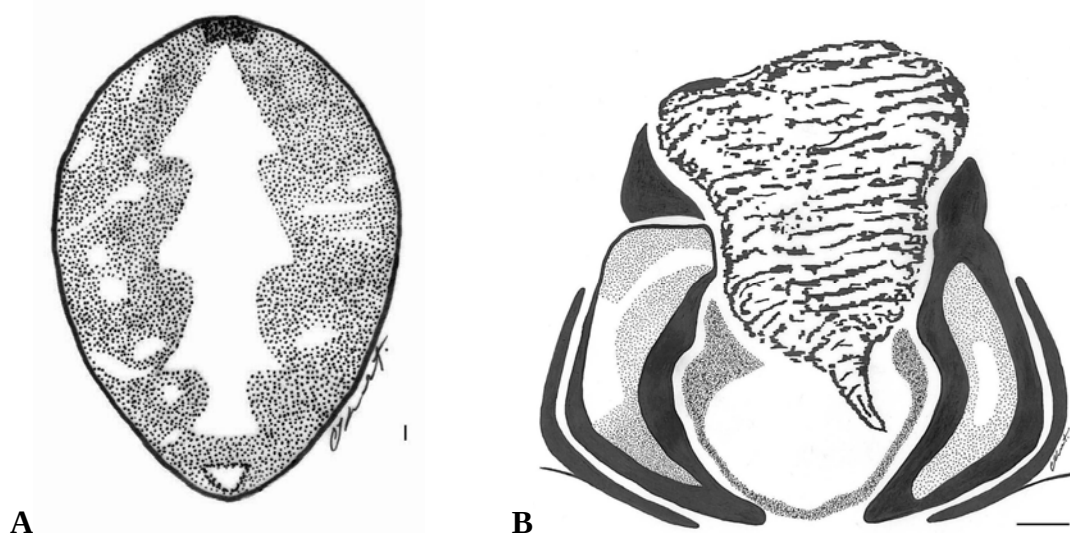


Fig. 2: *Aculepeira carbonaria* (L. Koch, 1869), female. A. Opisthosoma (Dorsal view). B. Epigyne (Ventral view). Scale lines = 0.25 mm.

Remarks: This species is very similar to the other Turkish araneid *Aculepeira ceropegia* (Walckenaer, 1802) but mostly dark coloured. According to Levi (1977), *A. carbonaria* is known only from European mountains, a thing is confirmed by Heimer & Nentwig (1991). Although it is treated by Platnick (2008) as a Palaearctic species, it seems that it has Euro-Asian range. The habitus, genitalia and body size of our specimens are similar to those of European specimens (Heimer & Nentwig, 1991).

II. Family Palpimanidae Thorell, 1870 (Palp-footed spiders) includes 130 described species in 15 genera (Platnick, 2008). Instead of the six spinnerets, palpimanids have only two. In addition to the reduced number of spinnerets, palpimanids can be easily recognized by greatly enlarged first legs. All segments of the leg I are modified. The coxa and trochanter are elongated and frequently bear dorsal tubercles. The femur is usually

expanded dorsally to twice the height of femora II through IV. The patella is enormously elongated and usually longer than the tibia. The tibia, metatarsus, and tarsus bear thick prolateral scopulae composed of spade-shaped setae that may be receptors of some kind. The metatarsus is much shorter than in most other spiders, and rarely is as long as the tarsus, which is typically widened at the tip (Platnick, 1975).

Genus *Palpimanus* Dufour, 1820 is characterized by having a red cephalothorax, more or less dark, large, with almost parallel margins and with a great cephalic development. It has six eyes in two lines on the front margin, the first line strongly procurved and the second slightly recurved. The appendages have the same colour of the prosoma and the first pair of legs is very strong.

Palpimanus sogdianus Charitonov, 1946 (Fig. 3)

Material examined: 2♀♀ (MTAS/Pal: 0703-04), Huzurlu Plateau, (36°58'46"N; 36°28'37"E, Gaziantep Province), 14.VI.2007, found under stones.

Description: Body length (n=2), 5.90 (5.79-6.02). Prosoma is reddish brown. Chelicerae have the same colour of prosoma. Legs I are reddish brown. Legs II and IV are yellowish brown. Legs measurements are given in Table (2). Opisthosoma is yellowish brown with a lot of small sclerotized spots.

World Distribution: Azerbaijan, Iran (Marusik & Guseinov, 2003); Central Asia (Platnick, 2008).

Table 2: Legs measurements of *Palpimanus sogdianus* from Turkey.

Leg (n=2)	Femur	Patella + Tibia	Metatarsus	Tarsus	Total
I	1.61	1.14	0.57	0.57	3.89
II	1.22	1.64	0.57	0.41	3.84
III	1.09	1.43	0.75	0.42	3.69
IV	1.43	2.00	0.98	0.58	4.99

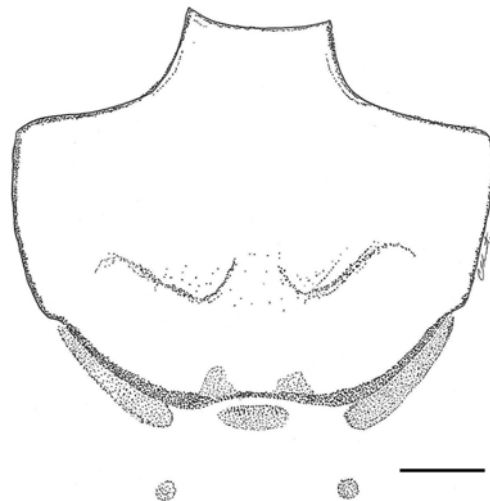


Fig. 3: *Palpimanus sogdianus* Charitonov, 1946, female. Epigyne (Ventral view) (redrawn after Marusik & Guseinov (2003: fig. 33).

Scale line = 0.25 mm.

Remarks: Marusik & Guseinov (2003) recorded *Palpimanus sogdianus* from Azerbaijan in 2003 and stated that it is most closely related to *Palpimanus schmitzi* Kulczyński, 1909 which is distributed in Syria and Israel. We could not get type or comparing material of this species, but our specimens are similar to Azerbaijani specimens of *P. sogdianus*, especially the sclerotised spot pairs of epigyneal area and general appearance.

III. Family Theridiidae Sundevall, 1833 (Cob web or Comb-footed spiders) includes 2288 described species in 98 genera (Platnick, 2008). Theridiids are commonly found in their webs on vegetation. Their general appearance may vary between genera, and they have relatively small globular opisthosoma and mostly circular prosoma. Tarsus IV is characteristic with a tarsal comb consisting of a few serrated bristles. These bristles may be absent and are often difficult to recognize in the immature and male (Bayram *et al.*, 2007a).

Genus *Episinus* Walckenaer, 1809 has oval prosoma. Clypeus is usually projecting. Eyes are on slight tubercles. First leg is generally longest. Abdomen flat, usually modified with humps or nipples, widest behind middle. Colulus replaced by two setae. Epigynum with distinct openings. A pair of seminal receptacles present. Palpus complex with all sclerites (Yoshida, 1983).

Episinus maculipes Cavanaugh, 1876 (Fig. 4)

Material examined: 1♀ (MTAS/The: 0612), Sarısalkım Village, (37°05'36.86"N; 37°16'42.29"E, Gaziantep Province), 12.XI.2006, collected from the top of a dry annual plant by aspirator; 1♀ (MTAS/The: 0824), In the garden of Opet Anatolian High School, (37°00'31.1"N; 36°37'13.4"E, Islahiye District, Gaziantep Province), 27.II.2008, collected from the top of an annual plant by aspirator.

Description: Body length (n=2), 5.03 (4.70-5.36). Ocular area is high. Prosoma is yellowish white, with brownish stains. Chelicerae are blackish brown. Sternum has median shiny blackish strips. A V shaped design, of yellowish white bristles, exists behind the ocular area. Legs are yellowish brown with rings, black spots and brownish bristles. Furthermore, first pair of legs is longer than the others. Legs measurements are given in Table (3). Opisthosoma is yellowish brown with darkish spots posteriorly. Anterior part is hump shaped. Posterior borders have a lot of blackish brown bristles. In addition, a brownish white cross like shape exists on the opisthosoma.

World Distribution: England to Algeria, Ukraine (Platnick, 2008).

Table 3: Legs measurements of *Episinus maculipes* from Turkey.

Leg (n=2)	Femur	Patella + Tibia	Metatarsus	Tarsus	Total
I	3.43	3.13	3.03	0.28	9.87
II	2.29	2.45	1.94	0.22	6.90
III	1.08	1.09	1.04	0.22	3.43
IV	2.57	1.99	2.56	0.28	7.40

Remarks: According to Heimer & Nentwig (1991), this species occurs on the leaves of bushes and trees. In this study, the specimens were found on annual plants. *E. maculipes* is a Western Palearctic species, widespread throughout southern Europe (Spain, France, Italy, Germany) including Isle of Wight in the north. It has also been recorded from Crimea (Kovblyuk *et al.*, 2008). Our report is the most easternmost range of *E. maculipes*. The habitus, genitalia and body sizes of our specimens are similar to those of European specimens (Heimer & Nentwig, 1991).

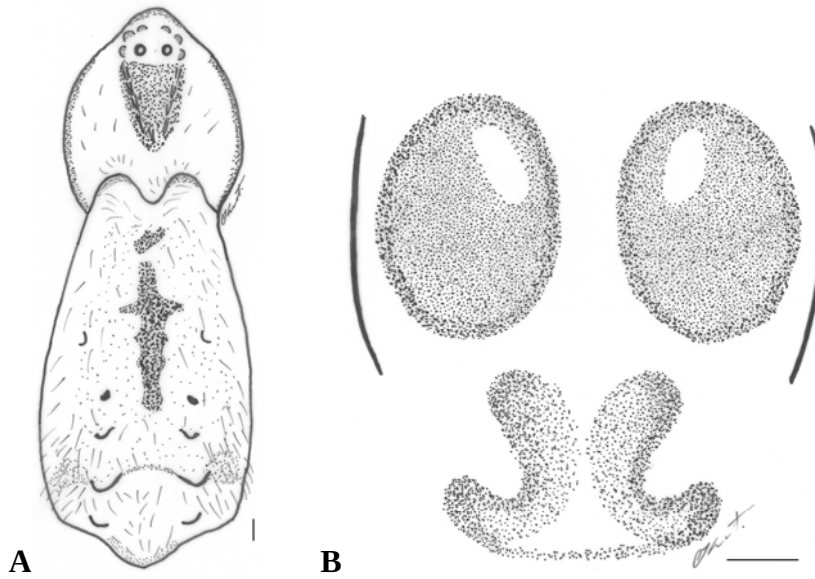


Fig. 4. *Episinus maculipes* Cavanna, 1876, female. A. Habitus (Dorsal view), B. Epigyne (Ventral view). Scale lines = 0.25 mm.

Acknowledgment

We are extremely indebted to Dr. Abdullah Bayram (University of Kırıkkale, Department of Biology, Turkey) for his valuable comments and corrections.

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The first record of family Hersiliidae from Turkey (Arachnida: Araneae)

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Abstract

Hersiliola macullulata (Dufour, 1831) (Araneae, Hersiliidae) and family Hersiliidae are recorded from Turkey for the first time.

Keywords: *Hersiliola macullulata*, Hersiliidae, Araneae, New Record, Turkey.

Introduction

Hersiliidae is a small family of flat, highly cryptic, medium-sized spiders, which mostly live on tree trunks or rocky crags. They can easily be recognized by the flattened body, raised eye region, the extremely long posterior spinnerets, and the long legs stretched out radially on tree bark or lichen-covered crags (Chen, 1994). The spiders are cryptic since their flat bodies are well camouflaged. Only the reflection of the sunlight on guide threads deposited on the tree trunks will help to find them (Dippenaar-Schoemann & Jocqué, 1997). They are very fast movers, in particular after disturbances. They subdue their prey by fixing it to the tree trunk with bands of silk produced by their rapidly rotating long spinnerets. The egg sac can be attached to the tree trunk like a little volcano or may hang on a stalk from branches (Baehr & Baehr, 1987). Hersiliidae Thorell, 1870 includes 157 described species belonging to 11 genera (Platnick, 2008).

Genus *Hersiliola* was described by Thorell in 1870. It includes five species. They are: *H. macullulata* (Dufour, 1831), *H. versicolor* (Blackwall, 1865), *H. simoni* (O.P.-Cambridge, 1872), *H. pallida* Kroneberg, 1875 and *H. afghanica* Roewer, 1960. No hersiliid species has been recorded before from Turkey (Topçu *et al.*, 2005). Only an unidentified specimen of *Hersiliola* is known from the South-East Anatolian Region of Turkey (Bayram, 2002). This is the first record of *Hersiliola macullulata* (Dufour, 1831) and the family Hersiliidae from Turkey.

Material and Methods

Three males and two females of *Hersiliola macullulata* (Dufour, 1831) were collected from Güveççi village, Yayladağı district, Hatay province, Turkey (Fig. 1). The specimens were preserved in 70% ethanol and deposited in the Arachnology Museum of the Turkish Arachnological Society (MTAS-TURKEY). The identification was made by means of a SMZ10A Nikon Stereo microscope with a camera lucida, using the key and data of Foord & Dippenaar-Schoeman (2005).

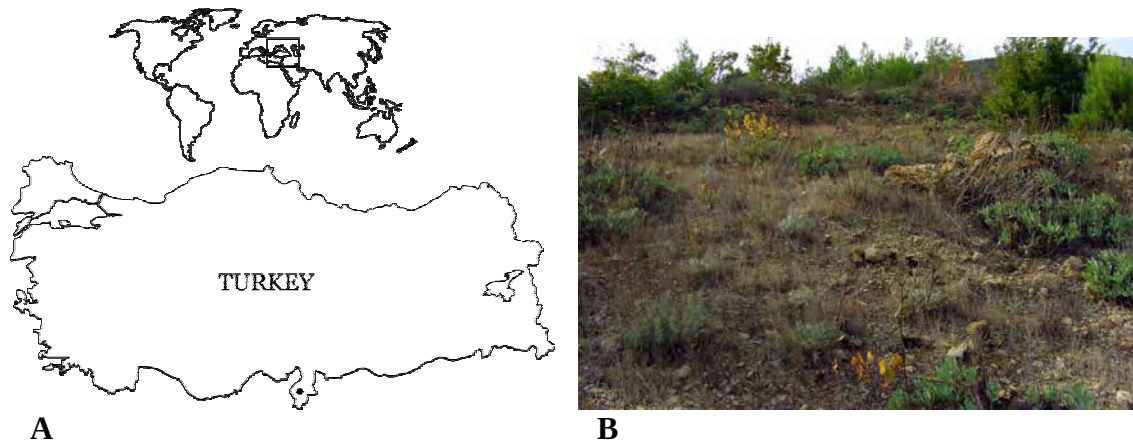


Fig. 1: A. Sampling locality of *Hersiliola macullulata* (Dufour, 1831) in Turkey (circle ● = Hatay Province). B. Habitat picture.

Results

Hersiliola macullulata (Dufour, 1831) (Fig. 2)

Material examined: 3♂♂ (MTAS/Her:0701-03) and 2♀♀ (MTAS/Her:0704-05), Güveççi village, Yayladağı district, Hatay province, Turkey (35°53'36.63"N, 36°9'38.10"E), 29.IV.2007, found under stones.

Description: Female (n=2): Body length 3.50-5.97 mm. Prosoma pale yellowish with dark spots; clypeus pale with median dark line. Ocular area darkish brown; opisthosoma yellowish with dark spots. Anterior median eyes are larger than others. Chelicerae are very elongate. Medioposterior part of epigyne T-shaped, widens posteriorly into broad sclerotization; copulatory ducts elongate, with at least four or more coils, extending well beyond large spermathecae; seminal receptacles small. Leg I measurements (mm): femur 2.47-2.51, patella+tibia 3.13-3.15, metatarsus 2.69-2.70, tarsus 1.01-1.03.

Male (n=3): Body length 3.27-3.86 mm, generally resemble females, but prosoma wider and body length smaller than females. Palpal tibia stout, as long as wide. Sperm duct regularly curved. Embolus coiled, filiform, originating retrolaterally on bulbus; median tegular apophysis hook shaped with apex acute. Leg I measurements (mm): femur 2.12-2.18, patella+tibia 2.57-2.61, metatarsus 2.24-2.28, tarsus 0.84-0.95.

Discussion

H. macullulata is a Palearctic species recorded from the Mediterranean region (Algeria, Spain and Israel) to Turkmenistan and also found in the Afrotropical region (Burkina Faso) (Levy, 2003; Foord & Dippenaar-Schoeman, 2005; Platnick, 2008). Habitus and other characters, epigyne and palp structures, are similar to those of Burkina Faso's specimens (Foord & Dippenaar-Schoeman, 2005). However, body size of Turkish

specimens is smaller than those specimens' size. Body length of Turkish specimens is averagely 3.5 mm in male, and 4.7 mm in female, while in Burkina Faso's specimens it is 3.75 mm for male, and 4.95 mm for female.

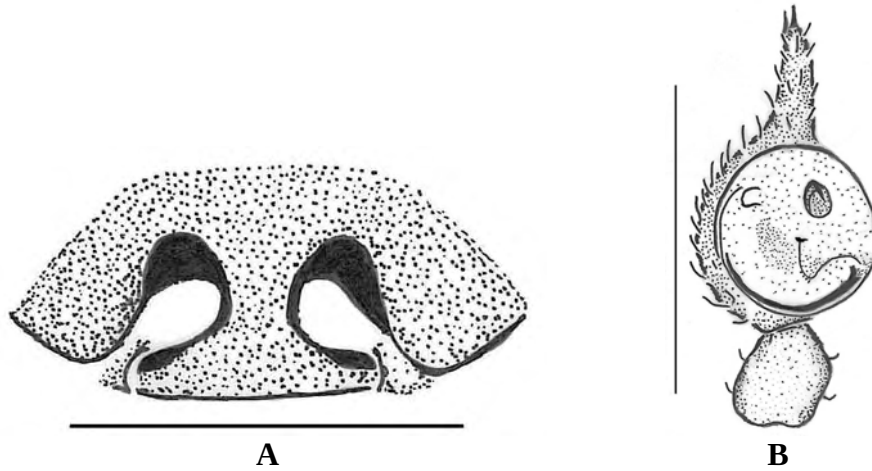


Fig. 2: *Hersiliola macullulata* (Dufour, 1831). A. ♀ Epigyne (Ventral view), B. ♂ Palp (Ventral view). (redrawn after Foord & Dippenaar-Schoeman (2005: figs. 2F, 2A). Scale lines: A = 0.5 mm, B = 1 mm.

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Sun-spiders of Sudan (Arachnida: Solpugida) [Introductory study]

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Abstract

This work includes a list of 25 species of 12 genera of 4 families of order Solpugida recorded from Sudan. Fifteen species are endemic. The distribution of every species is included. A key to the recorded families, genera and species is prepared.

Keywords: Sun-spiders, Solpugida, Arachnida, Sudan.

Introduction

My first visit to Sudan (23 July - 10 August 2008) activated me to get an idea about its arachnological fauna. I could find only a few papers dealing with arachnids of Sudan, especially its sun spiders. Hence, the following work is prepared to present a list of sun spiders species previously recorded from Sudan with keys to families, genera and species depending on the works of Roewer (1933, 1934), Turk (1960) and El-Hennawy (1990, 1999).

This preliminary list is mainly extracted from the works of Roewer (1933, 1934, 1941), El-Hennawy (1999) and Harvey (2003) in addition to the work of Benoit (1964). It includes 25 solpugid species classified within 12 genera and 4 families. Fifteen species are endemic, only recorded from Sudan. The distribution of every species in Sudan is included in the list after species name. After the list and key to families, a simplified catalogue of solpugid Sudanese species is presented including main references, the page number in Harvey's catalogue (2003), and distribution in the world and Sudan..

Abbreviations used:

{T} = Type species; * = endemic species, known only from Sudan;

[H 220] = Harvey's catalogue, 2003, p. 220.

Order Solpugida

List and distribution of Sudanese species of Order Solpugida

I. Family Daesiidae Kraepelin, 1899 2 genera, 6 species (2 *)

- Genus *Biton*** Karsch, 1880 5 spp. (2 *)
Biton bellulus (Pocock, 1902) * - Wadi Sinkat (?).
Biton ehrenbergi Karsch, 1880 {T} - Dunqulah (northern Sudan), Nubia.
Biton lividus Simon, 1882 * - Sennar, Kordofan: El Obeid.
Biton ragazzii (Kraepelin, 1899) - Port Sudan.
Biton wicki (Birula, 1915) - Abu-Gat, Sennar, Senga, Khartoum, Koshak, Darfur: Kulme.
Genus *Blossia* Simon, 1880 1 sp.
Blossia spinosa Simon, 1880 {T} - Sennar, Dilling, Kur el Affiun (southern Sudan).

II. Family Galeodidae Sundevall 1833 3 genera, 8 species (4 *)

- Genus *Galeodes*** Pallas, 1772 6 spp. (2 *)
Galeodes arabs C.L.Koch, 1842 – Khartoum, Omdurman, Shendi ?, Mongalla.
Galeodes barbarus Lucas, 1846 - Sudan.
Galeodes edentatus Benoit, 1964 * - Khartoum.
Galeodes granti Pocock, 1903 - Khartoum and its vicinity.
Galeodes kraepelini Roewer, 1934 - Shendi ?
Galeodes schendicus Roewer, 1934 * - Shendi.
Genus *Othoes* Hirst, 1911 1 sp. (1 *)
Othoes floweri Hirst, 1911 {T} * - Wadi Halfa.
Genus *Paragaleodes* Kraepelin, 1899 1 sp. (1 *)
Paragaleodes sericeus Kraepelin, 1899 * - Shendi ?

III. Family Rhagodidae Pocock 1897 4 genera, 6 species (6 *)

- Genus *Rhagodalmia*** Roewer, 1933 1 sp. (1 *)
Rhagodalmia melanocephala Roewer, 1933 {T} * - Nubia.
Genus *Rhagodessa* Roewer, 1933 3 spp. (3 *)
Rhagodessa cloudsleythompsoni Benoit, 1964 * - N. of Khartoum.
Rhagodessa melanocephala (Simon, 1879) {T} * - Nubia, Darfur (Zalingei).
Rhagodessa sudanensis Roewer, 1933 * - Sennar.
Genus *Rhagodeya* Roewer, 1933 1 sp. (1 *)
Rhagodeya nubia Roewer, 1933 {T} * - Nubia (Koshesh), Sennar.
Genus *Rhagoduna* Roewer, 1933 1 sp. (1 *)
Rhagoduna nocturna Roewer, 1933 {T} * - Sennar.

IV. Family Solpugidae Leach 1815 3 genera, 5 species (3 *)

- Genus *Solpugassa*** Roewer, 1933 1 sp.
Solpugassa dentatidens (Simon, 1879) - Bahr el Jebel or on the banks of the White Nile.
Genus *Zeria* Simon, 1879 3 spp. (2 *)
Zeria fordii (Hirst, 1907) - Nubia Mountains, Talodi.
Zeria funksoni (Birula, 1915) * - Galegu, Sennar (Central Sudan).
Zeria schweinfurthi (Karsch, 1880) * - Jur river (southern Sudan), Djebel Marra.
Genus *Zeriassa* Pocock, 1897 1 sp. (1 *)
Zeriassa sudanica Roewer, 1933 * - Sennar.

Key to Solpugid Families recorded in Sudan

- 1. Anus : ventrally located** **Family RHAGODIDAE**
Tarsal segmentation : 1-1-1-1
Heavy-bodied; short-legged; small to large (10-60 mm)
Leg 1 : tarsi : with a pretarsus + 2 claws
metatarsi : with a dense ventral clothing of short spinelike setae
Male cheliceral flagellum : paraxially immovable; composed of 2 flattened, curled, setae that form a nearly complete, slightly curved, truncate, hornlike tube on the mesial surface
Distribution : north-eastern Africa, south-western Asia, and Near East
[27 genera, 98 species]
- . Anus : terminally located 2
- 2. Tarsal segmentation : 1-4-4-(6-7)** **Family SOLPUGIDAE**
Long-legged; small to large (8-60 mm)
Leg 1 : tarsi : without claws
Male cheliceral flagellum : paraxially immovable; mesodorsal to dorsal, whiplike structure separated from the fixed cheliceral finger by a suture
Distribution : predominantly in Africa [17 genera, 191 species]
- . Tarsal segmentation : 1-1-1-1 to 1-2-2-4 3
- 3. Tarsal claws of legs 2 to 4 : setaceous** **Family GALEODIDAE**
Tarsal segmentation : 1-2-2-3
Long-legged; small to large (12-70 mm)
Leg 1 : tarsi : without claws or with 1 or 2 claws
Male cheliceral flagellum : paraxially movable; a single, capitate (terminally enlarged) seta located on the mesial surface
Distribution : northern Africa, and Asia [8 genera, 199 species]
- . Tarsal claws of legs 2 to 4 : smooth **Family DAESIIDAE**
Tarsal segmentation : 1-1-1-1 to 1-2-2-4
Long-legged; tiny to moderate-sized (6-23 mm)
Leg 1 : tarsi : without claws
Male cheliceral flagellum : paraxially movable, ovate to irregular membranous structure attached to the mesial surface by a disk
Propeltidium : exterior lobes : fused
Distribution : Africa, southern Europe, Near East, and South America
[6 subfamilies, 28 genera, 189 species]

I. Family Daesiidae Kraepelin, 1899 2 genera, 6 species (2 *)

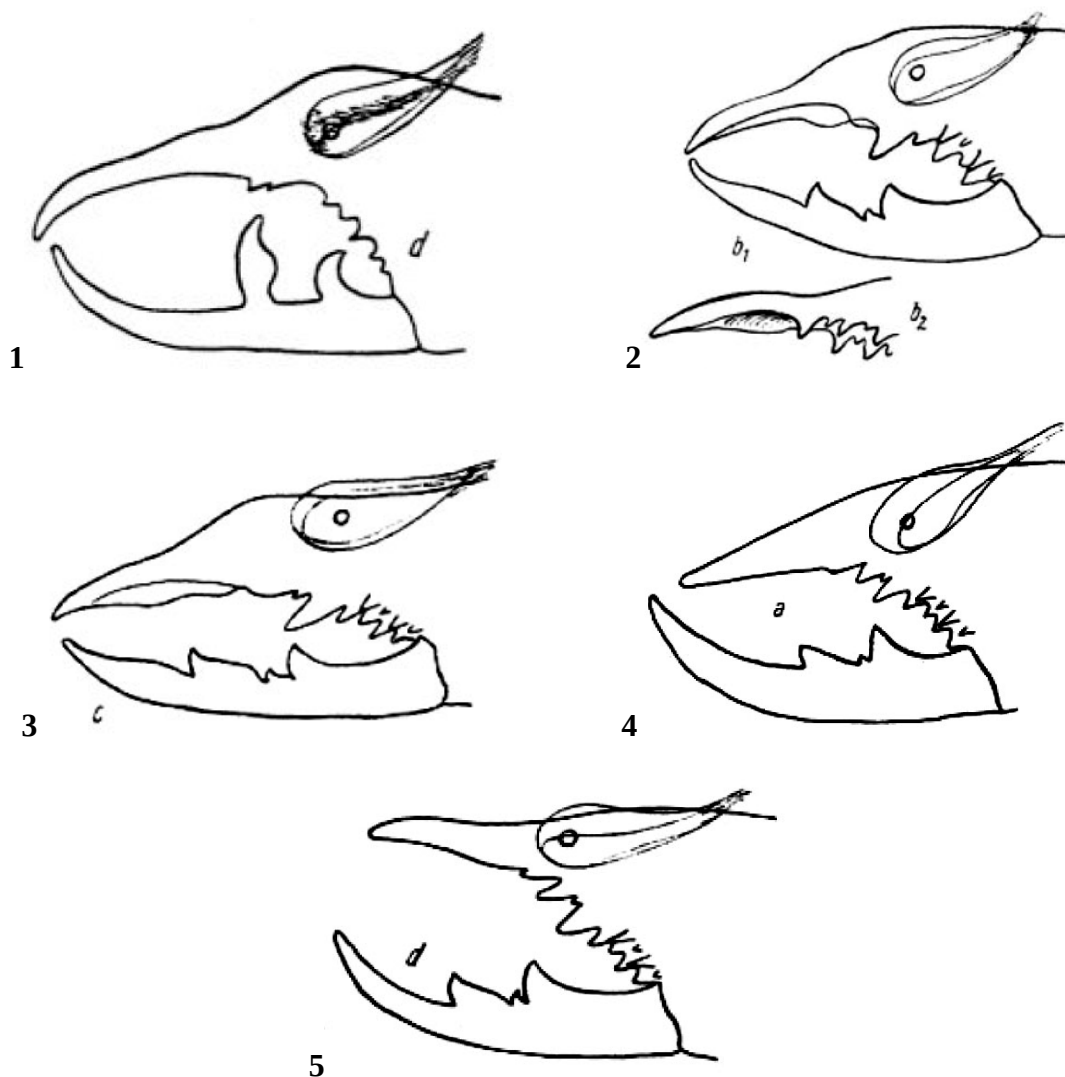
Key to genera

1. Tarsal segmentation 1-2-2-4 **Biton**
- . Tarsal segmentation 1-1-1-2 **Blossia**

Genus *Biton* Karsch, 1880 5 spp. (2 *)

Key ♂♂

1. Movable cheliceral finger with 1 front tooth and 1 main tooth; intermediate teeth wanting. Flagellum (Fig. 1). Body length 10 mm ***B. ragazzii***
- . Movable cheliceral finger with 1 front tooth, 1 big main tooth and 1 or 2 small intermediate teeth 2



Figs. 1-5. Prolateral view of ♂ right chelicera. (After Roewer, 1933)

1. *Biton ragazzii* (fig. 278 d p.398) 2. *Biton ehrenbergi* (fig. 275 b₁₋₂ p.389)
 3. *Biton bellulus* (fig. 275 c p.389) 4. *Biton wicki* (fig. 276 a p.392)
 5. *Biton lividus* (fig. 277 d p.395) (b₂ = tip of immovable finger oblique-lateral)

2. Edge of immovable finger solid, enlarged behind the tip forming a longitudinal groove against the front tooth of the movable finger. Immobile finger without front teeth (Figs. 2, 3) 3
 -. Edge of immovable finger without such longitudinal groove. Immobile finger with 1 or 2 distinct front teeth 4

3. Immobile finger without intermediate teeth, with main tooth and 4 median and lateral cheek teeth. Flagellum (Fig. 2). Pedipalp metatarsus ventrally with 1.2.2.2 spines and tarsus with 1 median spine. Colour pale yellow, legs yellow. Body length 14-18 mm

..... ***B. ehrenbergi***

-. Immobile finger with 1 small intermediate tooth before the main tooth. Flagellum (Fig. 3). Pedipalp only with bristles, tarsus without spines. Colour rusty yellow, opisthosomal tergite with 3 narrow yellow long stripes, legs brown. Body length 13 mm

..... ***B. bellulus***

4. Immovable finger with only 1 distinct front tooth and 1 intermediate tooth between the front tooth and the main tooth. Movable finger with 1 intermediate tooth. Flagellum (Fig. 4). Body length 18-20 mm **B. wicki**
 -. Immovable finger with 2 distinct front teeth and 1 intermediate tooth between the 2 front teeth and the main tooth. Flagellum (Fig. 5). Body length 10-11 mm **B. lividus**

Key ♀♀

1. Chelicerae quite uniformly rusty yellow, without dark brown longitudinal stripes 2
 -. Chelicerae with 2 dorsal dark brown longitudinal stripes (often besides a third lateral one). Opisthosomal tergite with more or less distinct brown median stripe 3
2. Tergite of the opisthosoma with distinct brown median stripe. Body length 10-12 mm **B. lividus**
 -. Tergite of the opisthosoma only with a hint of a brown median stripe. Body length 18 mm **B. ehrenbergi**
3. Tergite of the opisthosoma with three brownish longitudinal stripes. Body length 15 mm **B. bellulus**
 -. Tergite of the opisthosoma irregularly brownish. Body length 18-20 mm **B. wicki**

Biton bellulus (Pocock, 1902) [H 220]

Distribution: Sudan (Wadi Sinkat) ?.

Ref: 1. *B. b.* Roewer, 1933 pp. 391, 401, 402 fig. 275c.

Note. In Harvey (2003: p.220) "Type locality: Wadi Sikait, *Al Bahr al Ahmar*, Egypt. Distribution: Egypt". Nevertheless, Roewer (1933: p. 402) mentioned "*Biton bellulus* Pocock 1902 S. 6 (sub *Daesia*). ♂, ♀- Ägypten (Wadi Sinkat)". El-Hennawy (1998) made the same and recorded this species from Egypt too. But Wadi Sinkat is in Sudan (?).

Biton ehrenbergi Karsch, 1880 {T} [H 220-221]

Distribution: Cyprus, Egypt, Ethiopia, Greece, Italy, Palestine, Saudi Arabia, Somalia, Sudan (Dunqulah (as Dongolah), northern Sudan), Tunisia.

Ref: 1. *Daesia e.* Kraepelin, 1901 pp. 96-97 figs. 65-66. [Nubien]

2. *B. e.* Roewer, 1933 pp. 390, 391, 400, 402 figs. 275b₁₋₂, 278i.

3. *B. e.* Roewer, 1941 p. 140.

4. *B. e.* Benoit, 1964 pp. 96-97.

5. *B. e.* Delle Cave & Simonetta, 1971 pp. 44-45.

Biton lividus Simon, 1882 [H 222]

Type locality: Aswan (as Assuan), Aswan, Egypt.

Distribution: Egypt, Eritrea, Sudan.

Ref: 1. *Daesia livida* Kraepelin, 1901 p. 98. [Ober- Ägypten (Assuan)]

2. *B. l.* Roewer, 1933 p. 403 fig. 277d [Brit. und Ägypt. Sudan (Sennar, Kordofan; El Obeid)].

3. *B. l.* Benoit, 1964 p. 97.

Biton ragazzii (Kraepelin, 1899) [H 223]

Distribution: Djibouti, Eritrea, Sudan.

Ref: 1. *Daesia r.* Kraepelin, 1901 p. 99 fig. 68. [Erythraea]

2. *B. r.* Roewer, 1933 p. 403 fig. 278d [Erythraea, Port Sudan].

3. *B. r.* Roewer, 1941 p. 140.

4. *B. r.* Benoit, 1964 p. 97.

5. *B. r.* Delle Cave & Simonetta, 1971 pp. 46-48.

Biton wicki (Birula, 1915) [H 226]

Type locality: Abu-Gas, Sudan.

Distribution: Egypt, Ethiopia, Somalia, Sudan, Yemen.

Ref: 1. *B. w.* Roewer, 1933 p. 403 fig. 276a [Brit. und Ägypt. Sudan (Abu-Gat, Sennar, Khartoum, Koshak, Darfur: Kulme); Abessinien (Dire Dawa); Somaliland].

2. *Daesia w.* Whittick, 1941 pp. 48-49, fig. 8. [Anglo-Egyptian Sudan (Abu-Gat, Sennaar, Senga, Khartoum, Koshak, Darfur)]

3. *B. w.* Benoit, 1964 p. 96.

4. *B. w.* Delle Cave & Simonetta, 1971 p. 56.

Genus *Blossia* Simon, 1880

1 sp.

Blossia spinosa Simon, 1880 {T} [H 218]

Type locality: El Mex, *Al Iskandariyah* (Alexandria), Egypt.

Distribution: Algeria, Egypt, Morocco, Palestine, Sudan, Tunisia.

Ref: 1. *B. s.* Simon, 1880 p. 400.

2. *B. s.* Kraepelin, 1901 p. 102 fig. 74.

3. *B. s.* Roewer, 1933 pp. 371-372, figs. 265a¹⁻². [Oberägypten (Sennar, Dilling, Kur el Affiun)] (Fig. 6)

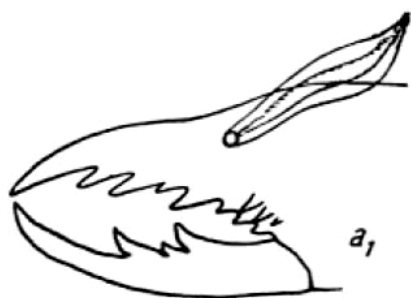


Fig. 6. *Blossia spinosa*, prolateral view of ♂ right chelicera.
(After Roewer, 1933 fig. 287c p.430)

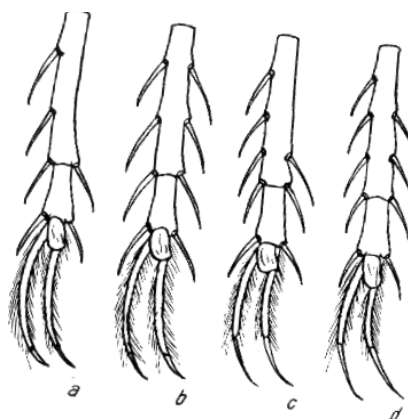


Fig. 7. Tarsal ventral spines of legs.
a-b. *Galeodes*. c-d. *Othoes*.
(After Roewer, 1934. fig. 313 d-g p.504)

II. Family Galeodidae Sundevall 1833 3 genera, 8 species (3 *)

Key to genera

1. Claws: unguiculus more or less half the length of the pedunculus of the claw. Tarsi of legs 2 & 3, segments 1 & 2 with 1.1.2.2/2 or 1.2.2.2/2 ventral spines (Fig. 7c, d) ***Othoes***
-. Claws: unguiculus never more than a quarter of the length of the pedunculus of the claw. Tarsi of legs 2 & 3, segments 1 & 2 with 1.1.2/2 or 2.2.2/2 ventral spines (Fig. 7a, b) 2

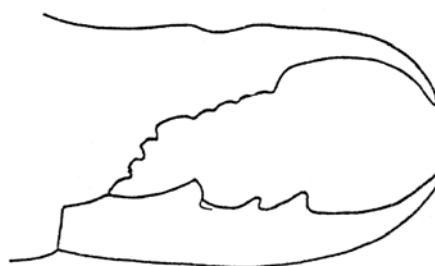
2. Tarsus I with a bush of hairs terminally and either without claws or with only rudimentary ones. Pedipalpal metatarsus of more or less equal thickness throughout its length. Tarsus of pedipalp ovate. Appendages short. Body, especially in the males covered with golden or bright canary yellow hairs. Male flagellum cochleariform, the two sides not symmetrically broadened ***Paragaleodes***

-. Tarsus I with a pair of small terminal claws usually easily seen. Pedipalpal metatarsus slimmer distally. Tarsus of pedipalp more or less pear-shaped. Appendages long. Body not covered with characteristic yellow hairs. Flagellum of male cultriform with the outline symmetrically broadened ***Galeodes***

Key ♂♂

1. Movable cheliceral finger with 1 intermediate tooth 2
- Movable cheliceral finger with 2 or 3 intermediate teeth 3
2. Immobile cheliceral finger with 1 intermediate tooth. Metatarsus of the pedipalp, ventrally, without cylindrical bristles. All sternites of the opisthosoma without sensory ctenidia. Plantar bristles of tarsus 4 needle-like (Type I). Colour uniformly brown. Body length 44 mm ***G. granti***
- Immobile finger without any clear tooth (Fig. 8). Metatarsus of the pedipalp, ventrally, with 7 pairs of short spines and cylindrical bristles. Sternite 6 of the opisthosoma with ctenidia composed of 14-16 long bristles. Colour yellowish-red. Body length 46-57 mm ***G. edentatus***
3. Movable finger with 3 intermediate teeth. Immobile finger with 2 intermediate teeth. Metatarsus of the pedipalp without cylindrical bristles. Colour rusty yellow. Opisthosoma with dorsal black median stripe. Body length 18mm ***G. schendicus***
- Movable finger with 2 intermediate teeth. Immobile finger with 1 intermediate tooth 4
4. Metatarsus of the pedipalp, ventrally, without cylindrical bristles. Only sternite 6 of the opisthosoma with ctenidia. Opisthosoma dorsally with entirely black median stripe. Plantar bristles of tarsus 4 obtusely clavate (Type IV). Body length until 34 mm ***G. barbarus***
- Metatarsus of the pedipalp, ventrally, with cylindrical bristles. At least sternite 6 of the opisthosoma with ctenidia 5
5. Tarsus 4 ventrally with especially differentiated plantar bristles needle-like (Type I). Sternites 5-7 of the opisthosoma with needle-like (Type I) ctenidia. Colour yellowish brown. Body length 35-51 mm ***G. arabs***
- Tarsus 4 ventrally without especially differentiated plantar bristles. Sternite 6 of the opisthosoma with a slanting row of needle-like ctenidia (Type I). Colour loam-yellow. Body length 24 mm ***G. kraepelini***

Fig. 8. *Galeodes edentatus* ♂, Right chelicera, exterior (retrolateral) view.
(After Benoit, 1964 p. 92, fig 2)

**Key** ♀♀

1. Movable cheliceral finger with 1 intermediate tooth (+ one small supplementary tooth, in one case of *G. edentatus*) 2
- Movable cheliceral finger with 2 intermediate teeth. Immobile cheliceral finger with 1 intermediate tooth 3
2. Immobile cheliceral finger with 1 intermediate tooth. Opisthosoma ventrally without ctenidia. Chelicerae rusty yellow with 2 dark longitudinal stripes. Body length 53 mm ***G. granti***

- Immovable cheliceral finger without any clear tooth. Sternite 6 of the opisthosoma with ctenidia composed of 14-16 long bristles. Metatarsus of the pedipalp, ventrally, with 7 pairs of short spines and cylindrical bristles. Colour yellowish-red. Body length 29-54 mm ***G. edentatus***

3. Sternite 6 of the opisthosoma with a slanting row of needle-like ctenidia (Type I). Body length until 51 mm ***G. arabs***

- Opisthosoma ventrally without ctenidia but with dorsal distinct dark median stripe. Body length until 34 mm ***G. barbarus***

Galeodes arabs C.L. Koch, 1842 [H 256-257]

Distribution: Algeria, Djibouti, Egypt, Ethiopia, Iran, Iraq, Kenya, Libya, Morocco, Niger, Oman, Palestine, Saudi Arabia, Somalia, Sudan, Syria, Tunisia, Turkey, Yemen.

Ref: 1. *G. a.* Kraepelin, 1901 p. 21. [Sudan]

2. *G. a.* Tullgren, 1909 p. 1 Omdurman.

[Tullgren (1909: p.1) recorded *Galeodes araneoides* (Pallas, 1772) from Shendy, depending on a young specimen. This may be misidentification.]

3. *G. a.* Roewer, 1934 pp. 518-519, 522-523, 532. [Khartoum, Mongalla.]

4. *G. a.* Roewer, 1941 p. 161.

5. *G. a.* Benoit, 1964 p. 97.

Galeodes barbarus Lucas, 1846 [H 259]

Distribution: Algeria, Egypt, Ethiopia, Libya, Morocco, Somalia, Sudan, Tunisia.

Ref: 1. *G. b.* Roewer, 1934 pp. 516, 523, 534.

2. *G. b.* Roewer, 1941 p. 162.

3. *G. b.* Benoit, 1964 pp. 95-96.

Galeodes edentatus Benoit, 1964 [H 262]

Type locality: Khartoum, *Al Khartum*, Sudan.

Distribution: Sudan.

Ref: 1. *G. e.* Benoit, 1964 pp. 92-95, figs 2-5 [Soudan: Khartoum].

Galeodes granti Pocock, 1903 [H 264]

Distribution: Egypt, Ethiopia, Palestine, Saudi Arabia, Somalia, Sudan, Syria, Yemen.

Ref: 1. *G. g.* Roewer, 1934 pp. 515, 522, 532.

2. *G. g.* Roewer, 1941 p. 162.

3. *G. g.* Benoit, 1964 p. 93 [Khartoum et environs].

Galeodes kraepelini Roewer, 1934 [H 265]

Type locality: Egypt (as "Ober-Ägypten").

Distribution: Egypt.

Ref: 1. *G. k.* Roewer, 1934 p. 533 [Ober-Ägypten (genauer Fundort ?)].

Note. The locality of this species may be „Schendi“, in Sudan, like the preceding and succeeding species in the same page.

Galeodes schendicus Roewer, 1934 [H 269]

Type locality: Shendi (as Schendi), *Nile*, Sudan.

Distribution: Sudan.

Ref: 1. *G. s.* Roewer, 1934 p. 533 [Ober-Ägypten (Schendi)].

Genus *Othoes* Hirst, 1911

1 sp. (1 *)

Othoes floweri Hirst, 1911 {T} [H 274]

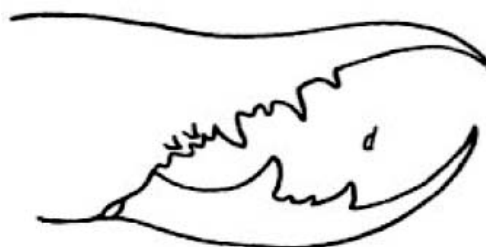
Type locality: Wadi (as Wady) Halfa, Sudan.

Distribution: Sudan (Wadi Halfa), Egypt ?.

Ref: 1. *O. f.* Roewer, 1934 p. 536 fig. 318 a, d Upper Egypt (Wadi Halfa). (Fig. 9)

Fig. 9. *Othoes floweri* ♀, prolateral view of left chelicera.

(After Roewer, 1934 fig. 315d p.535)



Genus *Paragaleodes* Kraepelin, 1899

1 sp. (1 *)

Paragaleodes sericeus Kraepelin, 1899 [H 276]

Type locality: Egypt (as "Oberägypten").

Distribution: Egypt ?, Sudan.

Ref: 1. *P. s.* Kraepelin, 1901 p. 27. [Ober-Ägypten]

2. *Galeodes s.* Roewer, 1934 pp. 517, 523, 533, fig. 317 [Ober-Aegypten (u. a. Schendi)].

Note. This species may be erroneously recorded from Egypt by El-Hennawy (1998: p.22) and Harvey (2003: p.276) following Roewer (1934: p. 533).

III. Family Rhagodidae Pocock 1897 4 genera, 6 species (6 *)

Key to genera

Number of ventral spines on :

Tarsus 2 & 3	Tarsus 4	Genus
0	1.1	<i>Rhagoduna</i>
1.2	2.2.2.2	<i>Rhagodessa</i>
1.2.2	1.1.2.2	<i>Rhagodeya</i>
2.2.2.2	2.2.2.2	<i>Rhagodalma</i>

Genus *Rhagodalma* Roewer, 1933

1 sp. (1 *)

Rhagodalma melanocephala Roewer, 1933 {T} [H 292]

Type locality: Nubia, Sudan.

Distribution: Sudan.

Ref: 1. *R. m.* Roewer, 1933 p. 288 [Nubien (genaue Lokalität?)].

Genus *Rhagodessa* Roewer, 1933

3 spp. (3 *)

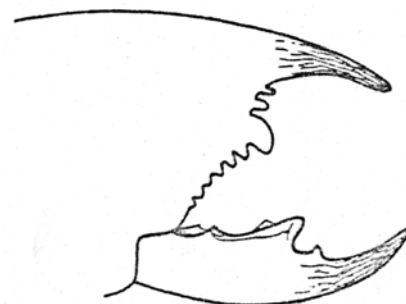
Key to species

1. Tibia II and III with 1 dorso-apical spine. Coxae I-III with a line of 6 bacilli. Body and all appendages dark brown, only coxae rusty yellow with red bacilli. Body length 30 mm ***Rhagodessa sudanensis***

-. Tibia II and III with 2 dorso-apical spines. Coxae I-III with a line of 2-4 bacilli. Chelicerae and propeltidium black. Opisthosoma grey yellow with pale dorsal longitudinal band till the quite black anal segment, all coxae, legs and pedipalps rusty yellow, metatarsus black and tarsus I red brown. Body length 20 mm ***Rhagodessa melanocephala***

2. Tibia II with 1 dorso-apical spine and Tibia III with 2 dorso-apical spines. Coxae I-II with 15-16 bacilli, coxae III with 6 bacilli. Prosoma and chelicerae blackish brown, with pale yellow borders and sides. Pedipalps bright brown except metatarsus and tarsus black. Chelicera (Fig. 10). Legs bright brown except tarsus I black. Opisthosoma with a wide median light brown band and black sides. Body length 44 mm
 ***Rhagodessa cloudsleythompsoni***

Fig. 10. *Rhagodessa cloudsleythompsoni* ♀
 Right chelicera, exterior (retrolateral) view.
 (After Benoit, 1964 p. 92, fig 1)



Rhagodessa cloudsleythompsoni Benoit, 1964 [H 296]
 Type locality: N. of Khartoum, *Al Khartum*, Sudan.
 Distribution: Sudan.
 Ref: 1. *R. c.* Benoit, 1964 pp. 91-92, fig.1.

Rhagodessa melanocephala (Simon, 1879) {T} [H 297]
 Type locality: Nubie, Sudan.
 Distribution: Eritrea, Sudan.
 Ref: 1. *Rhax m.* sp. nov. Simon, 1879 122-123 "Nubie", ♀ 20 mm.
 2. *Rhagodes melanocephalus* Kraepelin, 1901 pp. 37-38. [Nubien]
 3. *R. m.* Roewer, 1933 p. 283 [Nubien, Darfur (Zalingei)].
 4. *R. m.* Benoit, 1964 p. 97 [Darfur (Nubie)].

Rhagodessa sudanensis Roewer, 1933 [H 297]
 Type locality: Sennar, *Sennar*, Sudan.
 Distribution: Sudan.
 Ref: 1. *R. s.* Roewer, 1933 p. 283 [Sudan (Sennar)].
 2. *R. s.* Benoit, 1964 p. 97 [Sennar].

Genus *Rhagodeya* Roewer, 1933 1 sp. (1 *)
Rhagodeya nubia Roewer, 1933 {T} [H 297]
 Type locality: Koshesh, Sudan; Sennar, *Sennar*, Sudan.
 Distribution: Sudan.
 Ref: 1. *R. n.* Roewer, 1933 p. 284 [Nubien (Kosheh, Sennar)].

Genus *Rhagoduna* Roewer, 1933 1 sp. (1 *)
Rhagoduna nocturna Roewer, 1933 {T} [H 302]
 Type locality: Sennar, *Sennar*, Sudan.
 Distribution: Sudan.
 Ref: 1. *R. n.* Roewer, 1933 p. 271 [Sudan (Sennar)].
 2. *R. n.* Benoit, 1964 p. 97 [Sennar].

IV. Family Solpugidae Leach 1815 3 genera, 5 species (3 *)

Key to genera

1. Deutosternum wedge-shaped. Metatarsus of pedipalp ventrally often spiny. Ventral spination of : segments 2-4 of tarsus 2 & 3 : 2/0/2, segments 2-7 of tarsus 4 : 2/2/0/2/0/2
Zeriassa
- Deutosternum staff-shaped. Metatarsus of pedipalp ventrally never spiny 2
2. Ventral spination of : segments 2-4 of tarsus 2 & 3 : 2/0/2, segments 2-7 of tarsus 4 : 2/2/0/2/0/2
Solpugassa
- Ventral spination of : segments 2-4 of tarsus 2 & 3 : 2/2/2, segments 2-7 of tarsus 4 : 2/2/2/2/0/2
Zeria

Genus Solpugassa Roewer, 1933

1 sp.

Solpugassa dentatidens (Simon, 1879) [H 309]

Type locality: Bahr el Jebel (or White Nile, as rives du fleuve Blanc), Sudan.

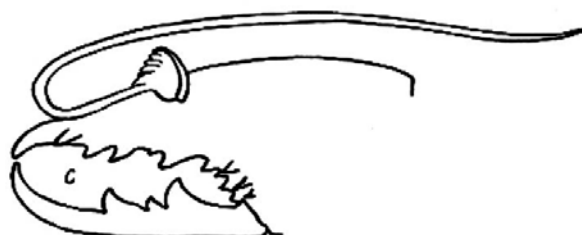
Distribution: Djibouti, Ethiopia, Somalia, Sudan (Bahr el Jebel or on the banks of the White Nile).

Ref: 1. *Gaetulia d.* Simon, 1879 115-116, figs.9, 10 "rives du fleuve Blanc", ♂.

2. *Solpuga d.* Kraepelin, 1901 p. 58. [Weisser Nil]

3. *S. d.* Roewer, 1933 p. 431 fig. 287c. (Fig. 11)

Fig. 11. *Solpugassa dentatidens*,
prolateral view of ♂ right chelicera.
(After Roewer, 1933 fig. 287c p.430)

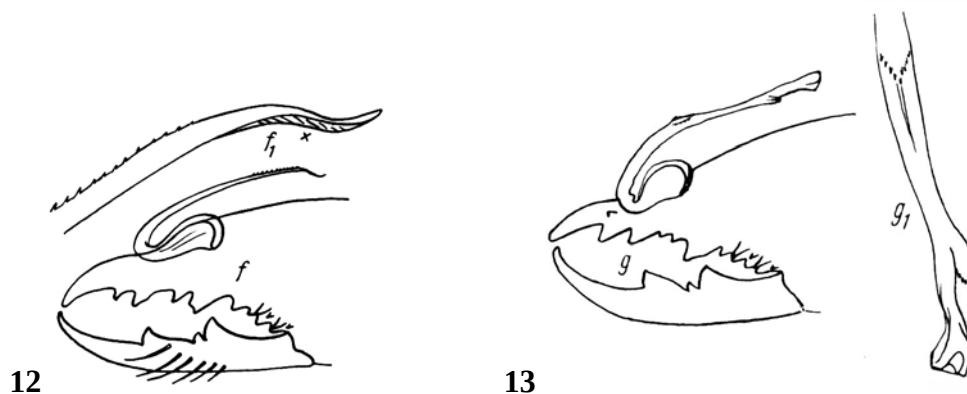


Genus Zeria Simon, 1879

3 spp. (2 *)

Key ♂♂

1. Flagellum (Fig. 12), its shaft end serrated, with a plain fine pointed end. Body length 32 mm **Zeria schweinfurthi**
- Flagellum (Fig. 13), its shaft end blunt, with small side teeth or projections near the end, with 1, often bright, lobe (Fig. 11), Body length 28-32 mm **Zeria fordii**



Figs. 12-13. Prolateral view of ♂ right chelicera. (After Roewer, 1933)

12. *Zeria schweinfurthi* (fig. 293 f p.445) 13. *Zeria fordii* (fig. 298 g p.453)

f₁ = Flagellum shaft end g₁ = Flagellum shaft end, dorsal view.

Key ♀♀

1. Immovable finger with only 1 intermediate tooth. Body length 32-35 mm *Zeria schweinfurthi*
- . Immovable finger with 2 intermediate teeth. Body length 30 mm *Zeria funksoni*

Zeria fordi (Hirst, 1907) [H 319]

Distribution: Democratic Republic of Congo, Ethiopia, Kenya, Sudan, Tanzania, Uganda.

Ref: 1. *Solpuga f.* Roewer, 1933 p. 463 figs. 298g, g¹ [Sudan: Nuba Mtns., Talodi].

Zeria funksoni (Birula, 1915) * [H 319]

Type locality: Galegu, Sennar, Sudan.

Distribution: Sudan.

Ref: 1. *Solpuga f.* Roewer, 1933 p. 465 [Ägypt. Sudan (Galezu)].

2. *Solpuga f.* Benoit, 1964 p. 97.

Zeria schweinfurthi (Karsch, 1880) * [H 323]

Type locality: Djur, Sudan.

Distribution: Sudan (Djur).

Ref: 1. *Solpuga s.* Kraepelin, 1901 p. 69 fig. 33. [Sudan (Djur-Gebiet)]

2. *Solpuga s.* Roewer, 1933 p. 464 figs. 293f, f¹ [East-Sudan (Djur-Gebiet, Djebel Marra)].

3. *Solpuga s.* Lawrence, 1953 p. 970 - 1♂, 1♀ (1935.10.17.11-12), Anglo-Egyptian Sudan; collected by Miss M. Steele, 1932.

4. *Solpuga s.* Benoit, 1964 p. 97.

Genus *Zeriassa* Pocock, 1897

1 sp. (1 *)

Zeriassa sudanica Roewer, 1933 * [H 327]

Type locality: Sennar, Sennar, Sudan.

Distribution: Sudan (Sennar).

Ref: 1. *Z. s.* Roewer, 1933 p. 428, fig. 284c [Brit.-Aegypt. Sudan (Sennar)].

2. *Zeriassa* sp. Lawrence, 1953 p. 962 - 1 juvenile ♀ (1935.10.17.394), Anglo-Egyptian Sudan; collected by Miss M. Steele, April 1932.

3. *Z. s.* Benoit, 1964 p. 97.

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